# DADF-B1

# SERVICE MANUAL

REVISION 0

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# INTRODUCTION

This Service Manual provides information needed to service the ADF in the field. This Service Manual consists of the following chapters:

Chapter 1 "General Description" introduces the ADF's features and specifications, and shows how to operate it.

Chapter 2 "Basic Operation" introduces the ADAF's mechanical and electrical systems; it also explains the principles used in these systems and the timing at which they are operated with reference to the ADAF's electrical circuitry.

Chapter 3 "Mechanical System" explains the ADAF's mechanical construction and how its parts may be disassembled/assembled and adjusted.

Chapter 4 "Maintenance and Servicing" provides tables of periodically replaced parts and consumables/durables and scheduled servicing charts.

Chapter 5 "Troubleshooting" provides tables of maintenance/inspection, standards/adjustments, and problem identification (image fault/malfunction).

Appendix contains a general timing chart and general circuit diagrams.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins, and be able to identify and isolate faults in the machine.

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# CHAPTER 1

# GENERAL DESCRIPTION


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# I. FEATURES

**1. Small in size, and light in weight.**

It is a document feeder designed as a single-frame unit for small size and light weight.

**2. Handles double-sided originals.**

It is equipped with a reversing delivery unit, capable of turning over originals and returning them to the copyboard glass.

**3. Wingless design.**

Its delivery tray is of an integrated construction.

**4. Automatic identification of original size.**

It is capable of identifying the size of an original in terms of lengthwise (feeding) and breadthwise directions for communication to its host copier.

**4. Handles mixed sizes.**

It can accommodate originals of different sizes (of the same width, i.e., configuration).

**5. Accommodates thick originals.**

It is equipped with a book equalizing hinge, enabling the use of a thick original (50 mm thick; e.g., book).

**6. Reversal delivery flapper.**

It rotates the reversal delivery motor clockwise and counterclockwise to open and close the flapper, switching the feeding path.

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# II. SPECIFICATIONS

| Item | Specifications |
|---|---|
| Pickup method | Automatic pickup/delivery |
| Type of original | Original tray: double-sided sheet (52 to 105 g/m$^2$); see Note 1.<br>Copyboard glass: book (50 mm thick max.) |
| Size of original | A3 (279 mm x 431.8 mm; 11"x17") to A5 (STMT)<br>Length: 140 to 432 mm (feeding direction)<br>Width: 140 to 297 (305) mm<br>Note: The values in parentheses indicate when the guide lock is released. |
| Orientation of original | Face up<br>1st page at top |
| Placement of original | Center reference |
| Original separation | Separation pad (top separation) |
| Original processing mode | Single-sided original processing (small-size, large-size), double-sided original processing |
| Height of stack (80 g/m$^2$ paper) | 30 sheets (small size; A4, B5, A5, STMT, LTR)<br>15 sheets (large-size; A3, 279x431.8 mm/11"x17", B4, LGL) |
| Mixing sizes | Possible (of the same width) |
| Size identification | Yes (feeding direction + default width) |
| Residual original detection | Yes (by LED) |
| 2-on-1 function | No (by copier's memory) |
| Stamp | No |
| Last original detection | 690 msec or less |
| Communication with copier | IPC 2 |
| Power supply | 24 VDC (from copier) |
| Serial numbers | ZSB xxxxx AB<br>ZSC xxxxx INCH/A<br>ZSD xxxxx A<br>ZSE xxxxx AB/INCH |
| Maximum power supply | 160 W or less at peak; 39 W in average |
| Weight | 12.8 kg (approx.) |
| Dimensions | 583 (W) x 506 (D) x 179 (H) mm |
| Operating environment temperature/humidity range | Same as copier |

**Table 1-201**


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Note 1:

The following may not be used as an original:

- Sheet with holes (as for filing).
- Sheet with a staple, clip, or adhesive.
- Sheet with a cut-and-paste patch.
- Sheet with a carbon back.
- Sheet with large curling, bending, or wrinkling.

If an original has large curling, straighten it out as much as possible, and place it so that the curling edge is the trailing edge.

**Note:**
The specifications are subject to change for product improvement.

Note 2:

Time Taken to Replace Originals

The value indicates the time passing from when an original is moved to when its trailing edge reaches the point of exposure. However, it does not include separation of the original.

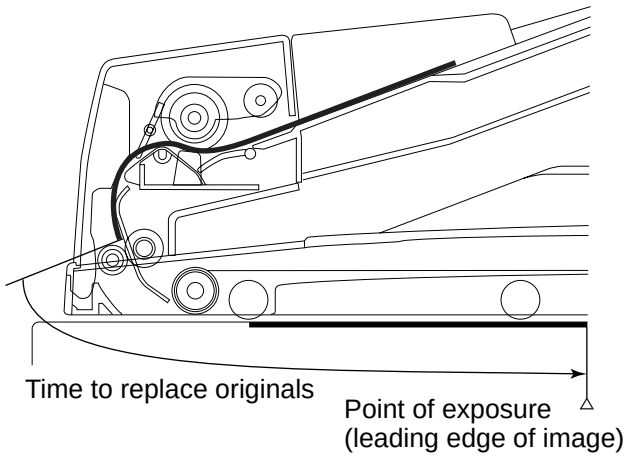


**Figure 1-201**

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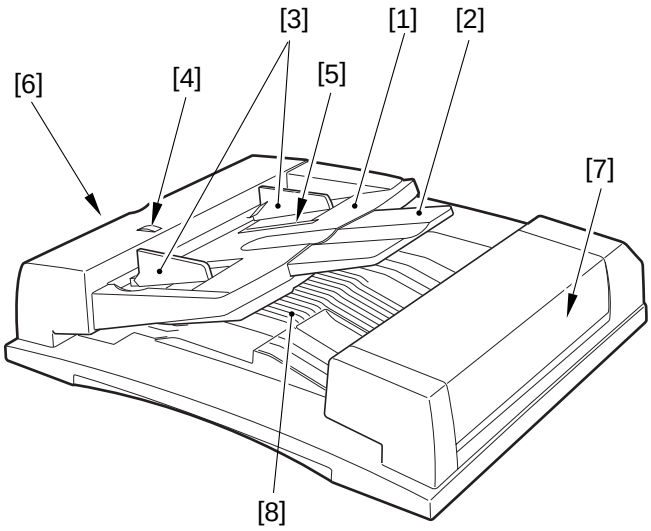
# III. NAMES OF PARTS

## A. External view




[1] Original tray
[2] Auxiliary tray
[3] Slide guides
[4] Original Set indicator
[5] Last original sensor
[6] Pickup unit cover
[7] Reversal delivery unit cover
[8] Original delivery tray

**Figure 1-301**

## B. Cross Section

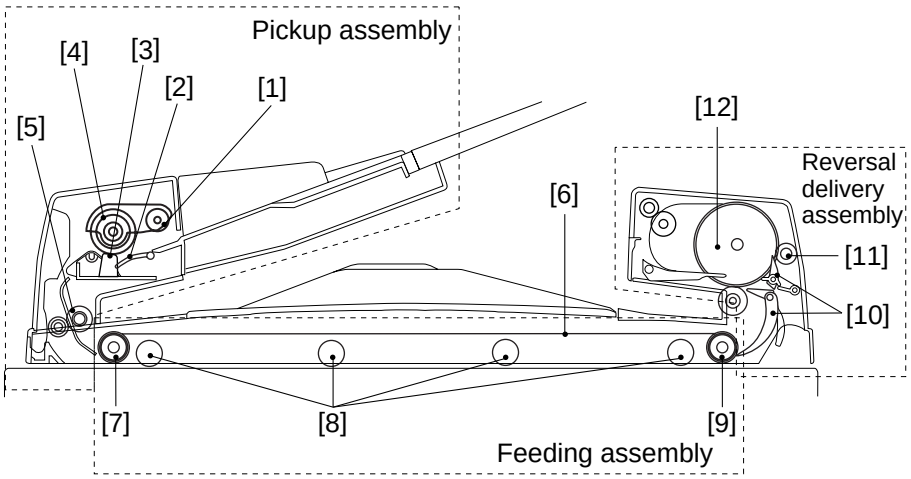



**Figure 1-302**

Pickup Assembly
[1] Pickup roller
[2] Lifter
[3] Separation pad
[4] Separation roller
[5] Registration roller

Feeding Assembly
[6] Feeding belt
[7] Feeding belt drive roller
[8] Retaining roll
[9] Feeding belt linkage roller

Reversal Delivery Assembly
[10] Reversal delivery flapper
[11] Reversal delivery registration roller
[12] Reversing roller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# IV. OPERATIONS

## A. Original Set Indicator

The Original Set indicator turns on when an original is on the original tray, and it starts to flash when a jam occurs.

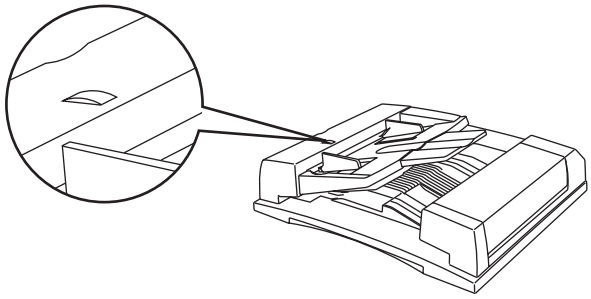

**Figure 1-401**

## B. Making Copies

1) Adjust the slide guides to suit the size of the originals.

2) Place the stack of originals against the end plate of the original tray with the first page on top.

3) Set the copier to the appropriate copying mode.

4) Press the copier's Copy Start key.

## C. Warnings and Actions

You can suspect an original jam if the Original Set indicator has started to flash. Make the following checks, and take the appropriate actions:

1) Open the pickup unit cover and the reversal delivery unit; then, remove any original jam.

2) Remove the originals from the original tray.

3) Open the ADF, and remove any original jam.

4) Remove any original from the copyboard glass.

5) Close the ADF.

6) Put the originals back into order, and place the stack on the original tray once again.

7) Press the copier's Copy Start key.

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## D. Routine Inspection by the User

Instruct the user to clean the following on a regular basis:

### 1. Copyboard Glass

Clean it using a cloth moistened with water or alcohol; then, dry wipe it.

### 2. Feeding Belt

Clean it using water or alcohol.

### 3. Others

If any part of the external panels of the ADF is soiled, clean it with a solution of mild detergent; then, dry wip it.


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# CHAPTER 2

# BASIC OPERATION


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# I. BASIC CONSTRUCTION

## A. Outline of Electrical Circuitry

The major electrical mechanisms of the ADF are controlled by a microprocessor (CPU) on the ADF controller PCB.

The microprocessor is designed to read signals from sensors and its host copier to generate signals used to drive loads (motors, brakes).

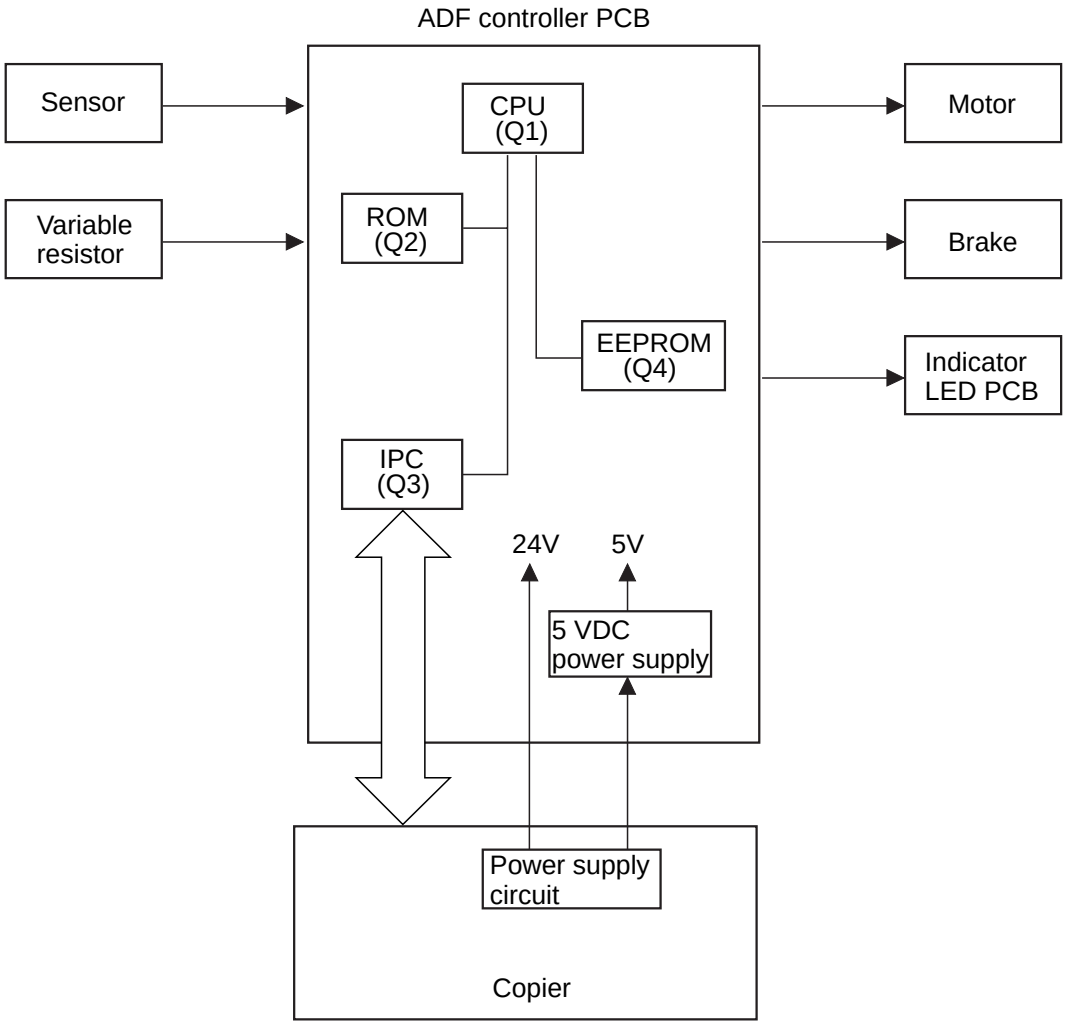


**Figure 2-101**

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# B. Inputs to the ADF Controller PCB

## 1. Inputs to the ADF Controller PCB (1/2)

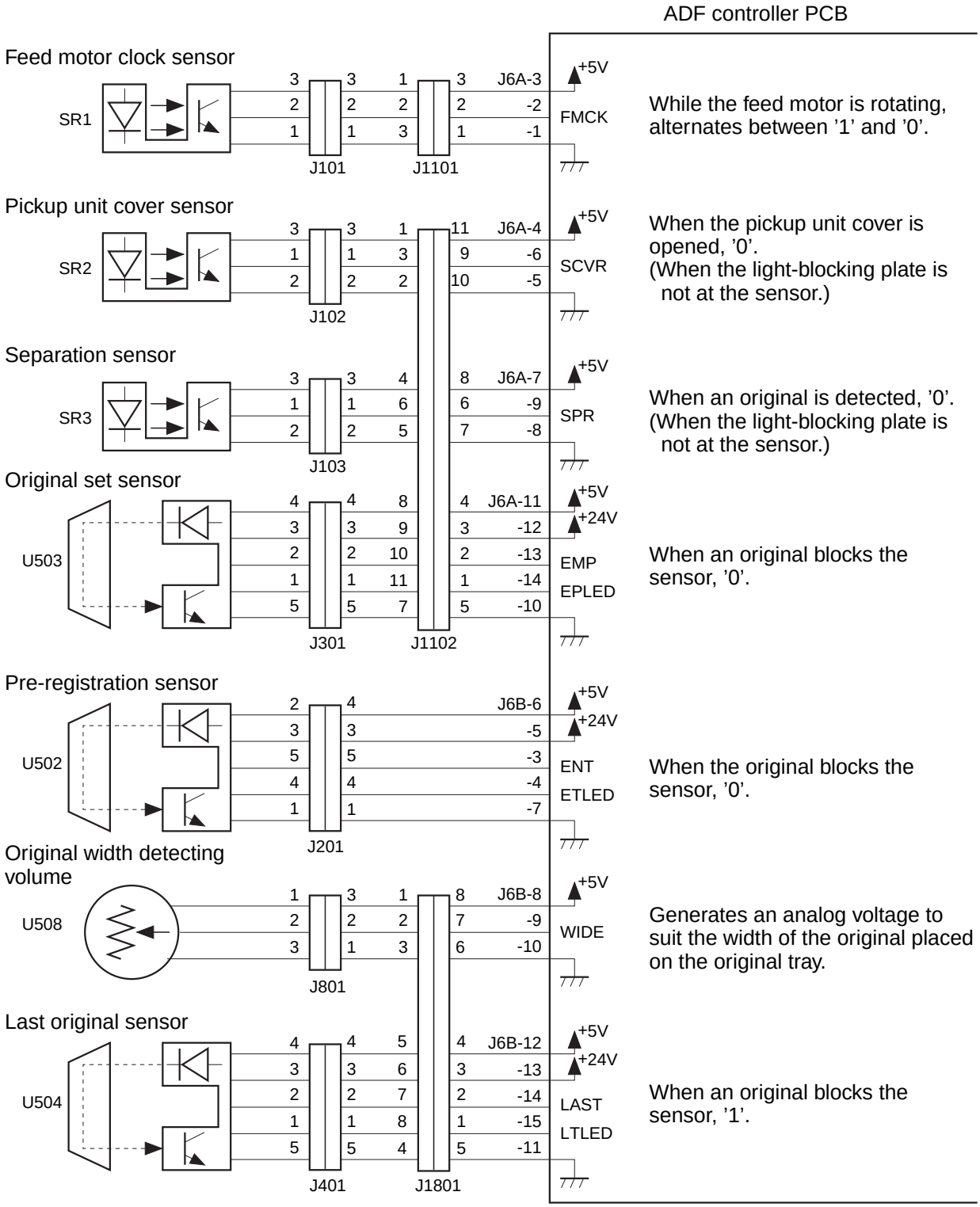


**Figure 2-102**


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## 2. Inputs to the ADF Controller PCB (2/2)

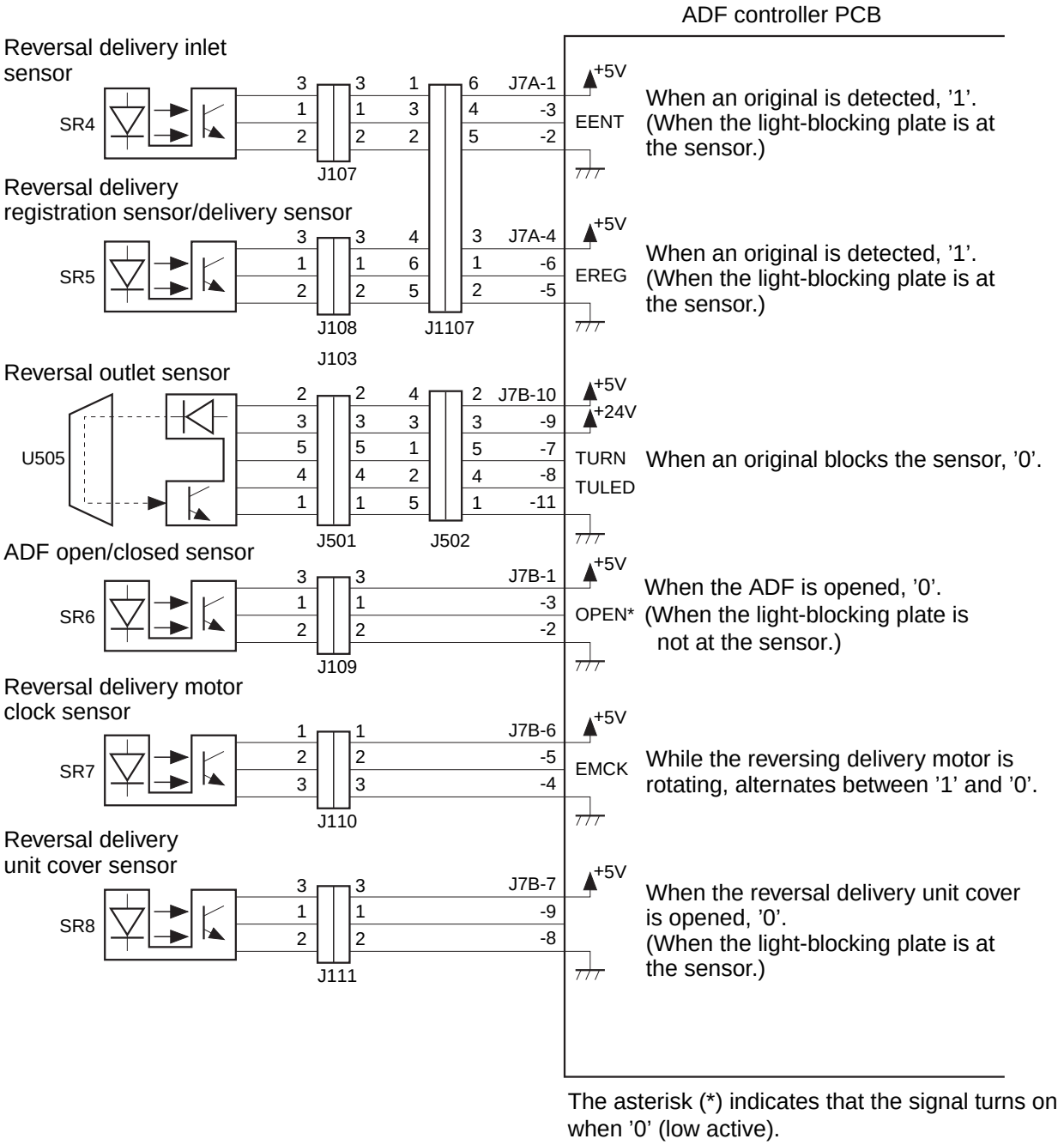


**Figure 2-103**

# C. Outputs from the ADF Controller PCB

## 1. Outputs from the ADF Controller PCB (1/1)

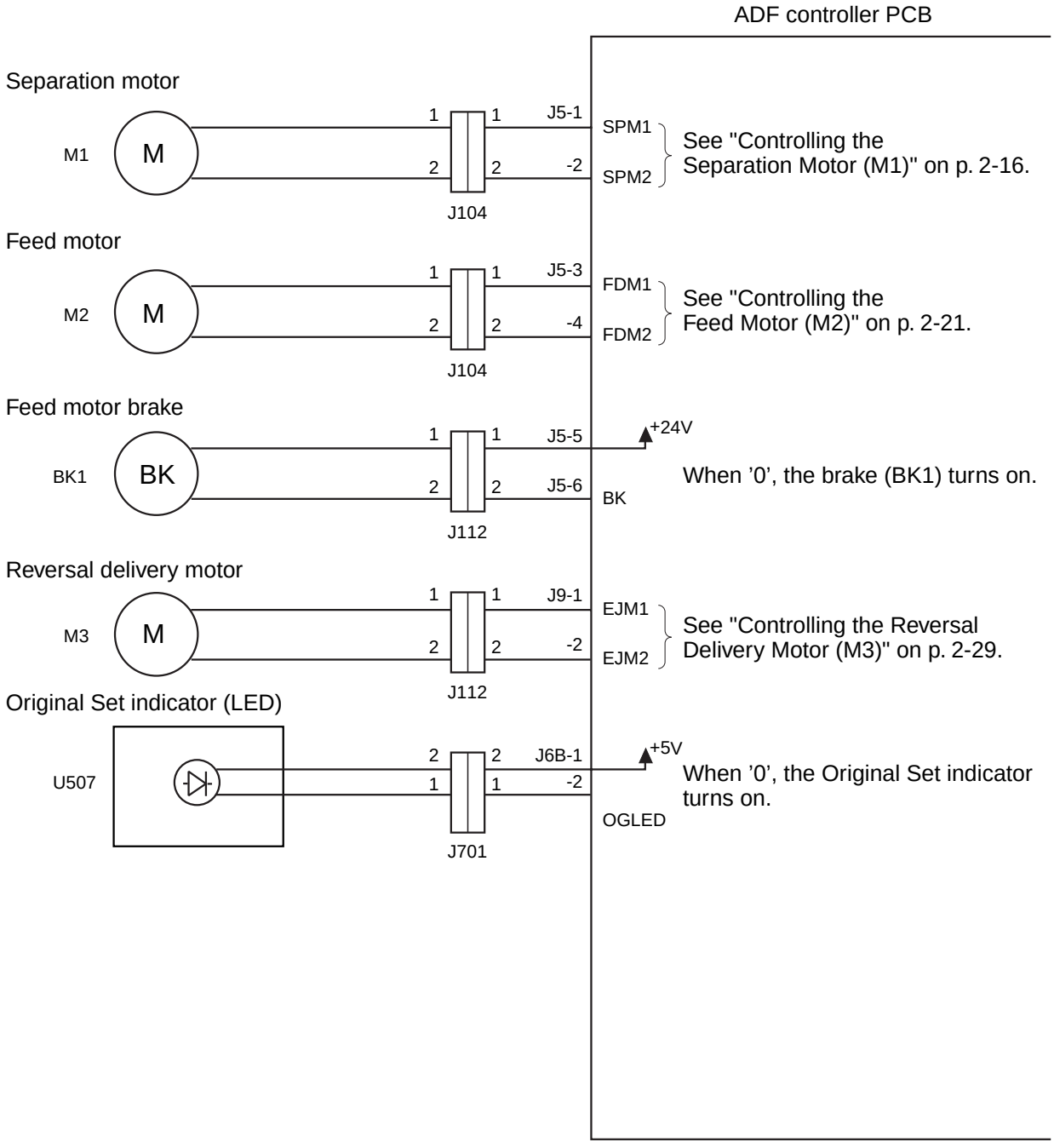


**Figure 2-104**


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# II. BASIC OPERATIONS

## A. Outline

The ADF is equipped with three motors for separation, feeding, and delivery (reversal) and one brake.

The separation motor (M1) is used to separate and pick up originals. The feed motor (M2) is used to move originals to and stop them at the copyboard glass, while the reversal delivery motor (M3) is deigned to deliver or reverse originals. The brake (BK) serves to stop the operation of the feed motor (M2).

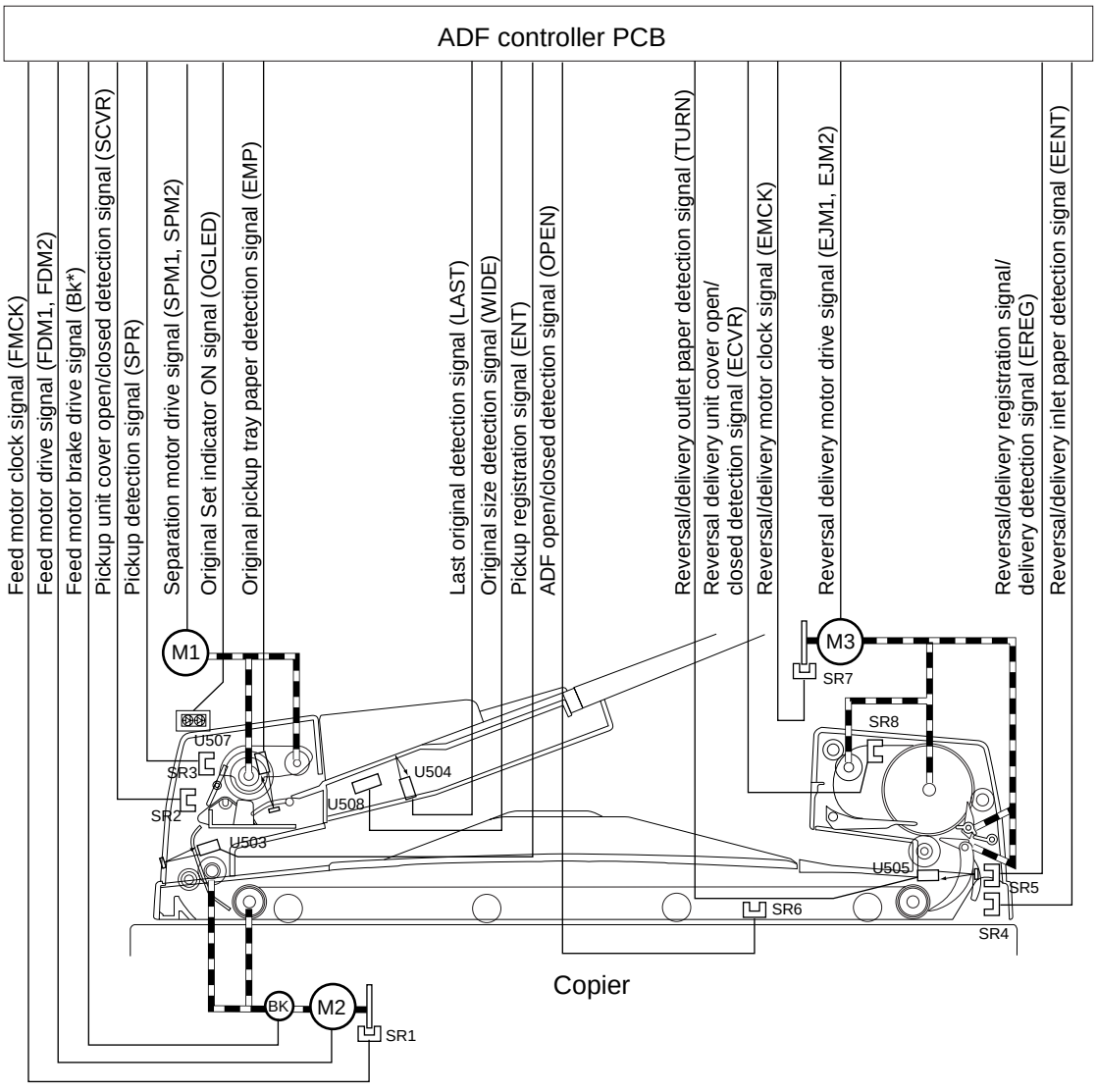


**Figure 2-201**

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## B. Detecting an Original

### 1. Outline

The ADF is equipped with the following three types of original detecting mechanisms:

a. Detecting the Presence/Absence of an Original

It detects the presence/absence of an original on the original tray.

b. Identifying the Size of an Original

It identifies the length (feeding direction) and width of an original.

c. Detecting the Last Original

It detects the trailing edge of the last original.

a. Detecting the Presence/Absence of an Original

The presence/absence of an original on the original tray is detected by the original set sensor. When an original is placed on the original tray, the light from the light-emitting side of the original set sensor is blocked, and the light-receiving side of the original set sensor starts to send the original detection signal (EMP) to the ADF controller PCB.

In response, the ADF controller PCB generates the original set indicator ON signal (OGLED) to turn not the Original Set indicator (U507).

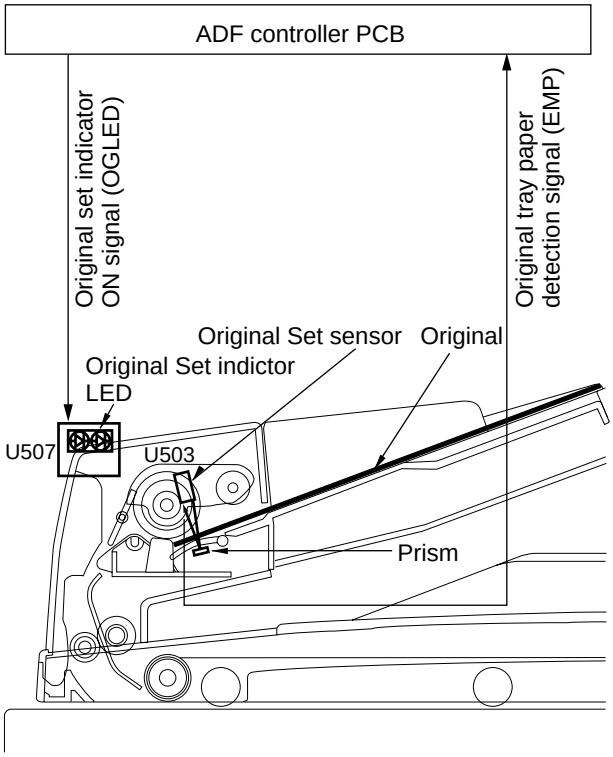


**Figure 2-202**


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b. Identifying the Size of an Original

The ADF identifies the size of an original in terms of length (feeding direction) and width.

The length is computed in reference to the number of clock signals from the pre-registration sensor (U502) and the registration roller.

When the pre-registration sensor detects the leading edge of an original (ON) and the trailing edge (OFF), the ADF controller computes the time taken by the original to move past the pre-registration sensor with reference to the number of clock signals from the feed motor clock sensor (SR1) to find out the size in the lengthwise direction (feeding direction).

The ADF controller uses the result to identify a default size, and communicates it to the copier so that copy paper of the appropriate size may be selected.

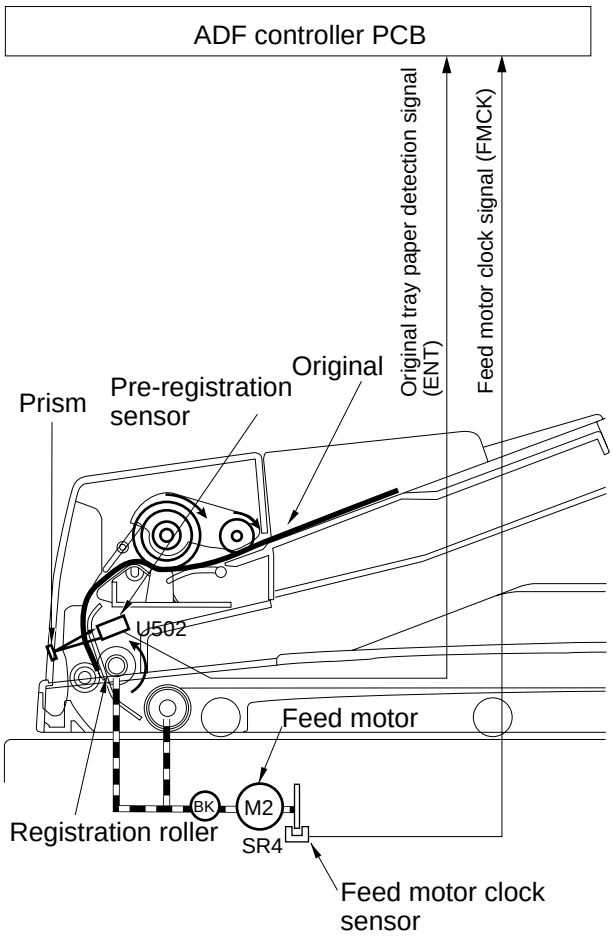


**Figure 2-203**

The ADF refers to the original width detecting volume (U508) located inside the original tray to find out the width of an original.

The original width detecting volume operates in conjunction with the slide guides, and the resistance of the voltage varies in analog mode. The ADF controller uses changes occurring in the resistance as the original size detection signal (WIDE), and uses them to find out the width of a specific original.

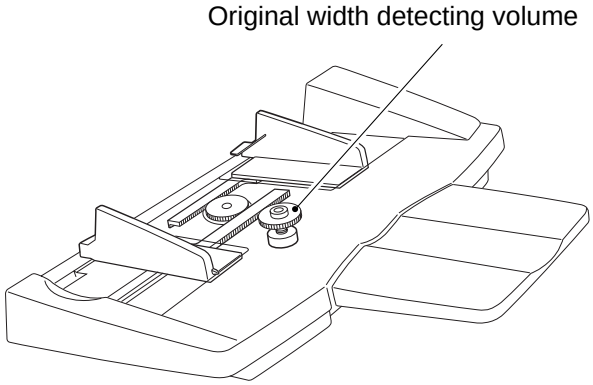


**Figure 2-204**

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· Slide Guide Lock

The ADF is equipped with a slide guide lock so that the slide guides will not move any farther than 297 mm (A4 length or A3 width).

If an original larger than 297 mm is used, the slide guide lock may be released (to accommodate up to 305 mm). The length of the original, nevertheless, must be 32 mm or less.

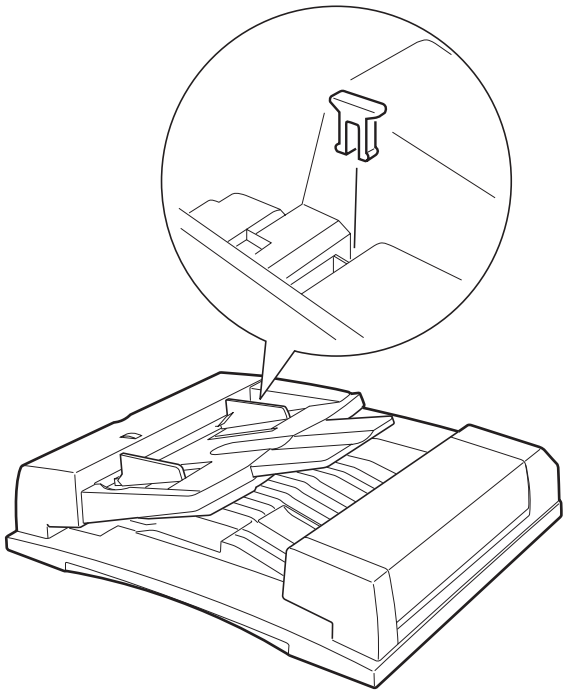

**Figure 2-205**

The copier assumes that any original is an original of a default size based on the data on length and width from the ADF. Tables 2-201, -202, and -203 show the default sizes that the copier will assume in reference to the length and width data.

· A/B-Configured ADF

| Default size | Length (mm) | Width (mm) |
|---|---|---|
| B5R | 237 to 297 | 180 to 184 |
| A5 | 128 to 188 | 208 to 212 |
| A4R | 277 to 317 | |
| B5 | 162 to 222 | 255 to 259 |
| B4 | 344 to 404 | |
| COMPUTER | 361 to 421 | 277.4 to 281.4 |
| A4 | 190 to 250 | 295 to 299 |
| A3 | 400 to 460 | |

A default size is identified in reference to ±10 mm for the length of an original, and ±5 mm for the width. Any lengths or widths falling outside these ranges will be assumed to represent a non-default size original.

**Table 2-201**

· Inch-Configured ADF

| Default size | Length (mm) | Width (mm) |
|---|---|---|
| STMT | 120 to 180 | 213.9 to 217.9 |
| LTRR | 259 to 309 | |
| FLSC | 310 to 343 | |
| LGL | 343 to 396 | |
| LTR | 196 to 256 | 277.4 to 281.4 |
| COMPUTER | 361 to 411 | |
| 11x17(297.4 to 431.8) | 412 to 472 | |

A default size is identified in reference to ±10 mm for the length of an original, and±5 mm for the width. Any lengths or widths falling outside these ranges will be assumed to represent a non-default size original.

**Table 2-202**


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· Inch/A/B-Configured ADF

| Default size | Length (mm) | Width (mm) |
|---|---|---|
| B5R | 237 to 297 | 180 to 184 |
| A5 | 128 to 188 | 208 to 212 |
| A4R | 277 to 337 | |
| STMT | 120 to 180 | 213.9 to 217.9 |
| LTRR | 259 to 309 | |
| FLSC | 310 to 343 | |
| LGL | 343 to 396 | |
| B5 | 162 to 222 | 255 to 259 |
| B4 | 344 to 404 | |
| LTR | 196 to 256 | 277.4 to 281.4 |
| COMPUTER | 361 to 411 | |
| 11x17(297.4 to 431.8) | 412 to 472 | |
| A4 | 190 to 250 | 295 to 299 |
| A3 | 400 to 460 | |

A default size is identified in reference to ±10 mm for the length of an original, and ±5 mm for the width. Any lengths or widths falling outside these ranges will be assumed to represent a non-default size original.

**Table 2-203**

c. Identifying the last Original

A copier with a long paper path (from cassette to drum) is designed to pick up copy paper early to enable faster copying operation. As such, when the ADF picks up the last original and places it on the copyboard glass, the copier may already have finished picking up copy paper.

The ADF moves the second original as far as the pre-registration sensor immediately after it picks up the first original (advance separation). If the last original sensor does not detect an original, the ADF controller will assume the original as the last original and sends the last original detection signal (LAST) to the copier so as to prevent pickup of copy paper.

Last Original Detection and Original Sizes
default size: B5, A4, LTR
length: 170 to 190 mm; 205 to 226 mm

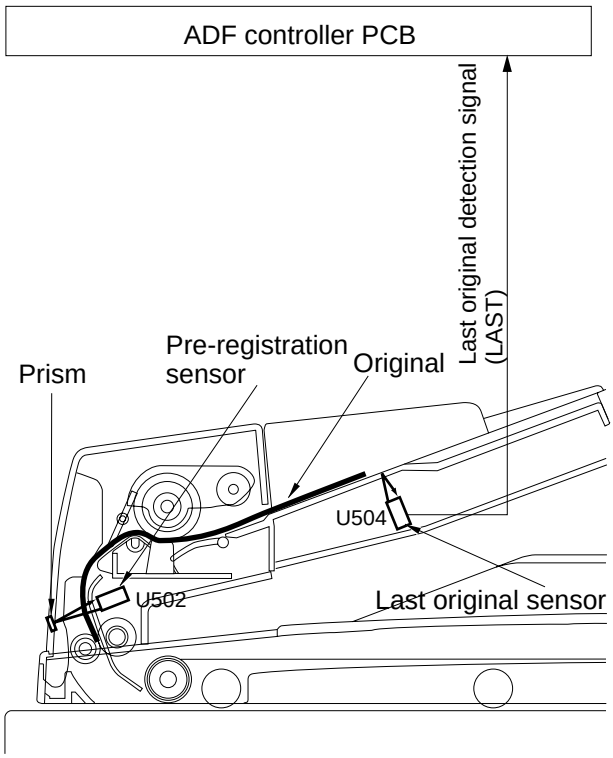


**Figure 2-206**

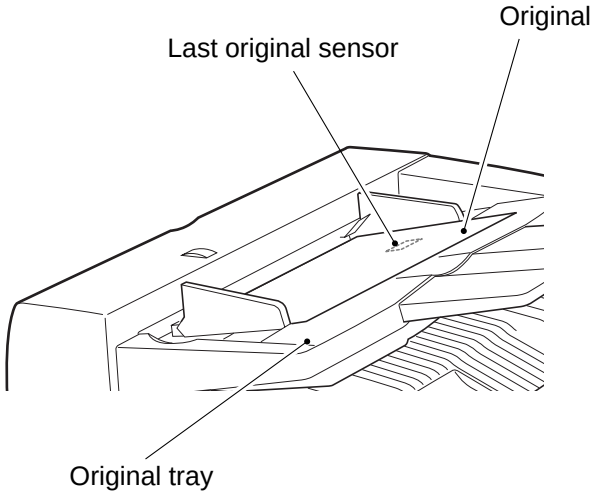


**Figure 2-207**

· Counting Originals

The number of times that the registration sensor has turned on in response to the trailing edge of an original is used as the number of originals.

The ADF is not equipped with an original feed mode for counting originals when making double-sided copies of single-sided originals. The originals are copied in order of how they are picked up and delivered accordingly.


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# C. Picking Up and Separating Originals

## 1. Outline

The pickup roller and the lifter are moved up so as to hold the entire stack of originals, and the separation roller is rotated. When this takes place while the stack is butted against the separation pad, the topmost sheet is separated from the rest of the stack.

The pickup roller is moved down and the lifter is moved up by rotating the separation motor (M1) counterclockwise. On the other hand, the pickup roller is moved up, the lifter is moved down, and the separation roller is turned by rotating the separation motor (M1) clockwise.

The separation assembly is equipped with a separation sensor (SR3) to monitor the movement of originals.

When the copier's Copy Start key is pressed while originals are placed on the original tray, the originals are picked up and separated in the following sequence of operations:

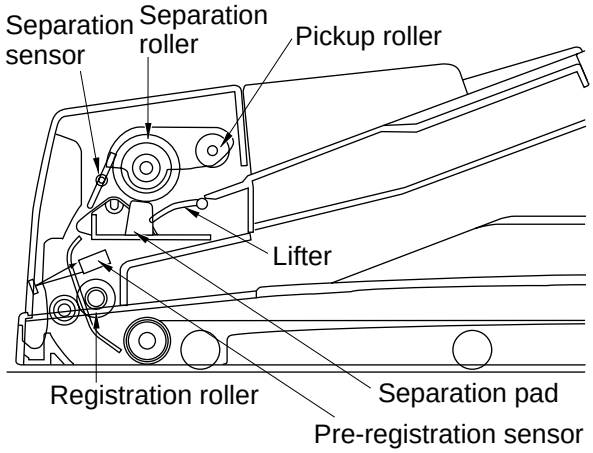


**Figure 2-208**

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1. Starting Ascent (pre-separation)

When the separation motor (M1) rotates counterclockwise, the lifter moves up to hold up the entire stack of originals from under, while at the same time the pickup roller moves down onto the stack to hold it in place.

The separation motor rotates counterclockwise for 250 msec and then stops.

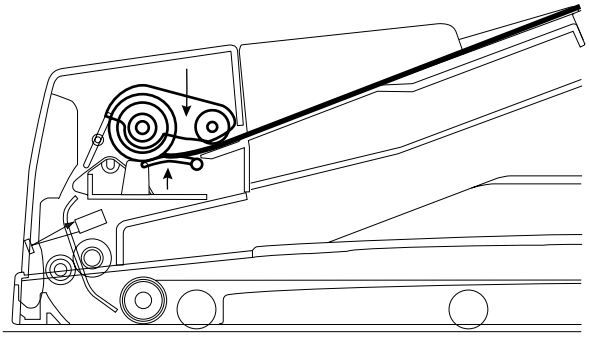

**Figure 2-209**

2. Pickup/Separation Operations

When the separation motor (M1) rotates clockwise, its drive reaches the pickup roller and the separation roller and, as a result, the first (topmost) original is picked up. The separation pad is used to make sure that only one original is separated and moved to the registration roller.

At the end of this operation, the lifter starts to move down, and then the pickup roller moves up.

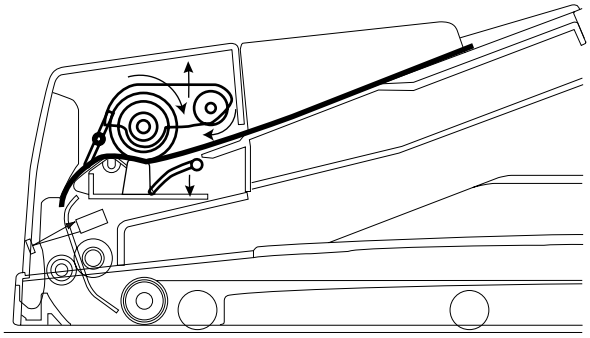

**Figure 2-210**

3. Arching

The original is butted against the registration roller, and is made to arch. The separation roller stops to rotate 52 msec after the pre-registration sensor (U502) detects the leading edge of the original.

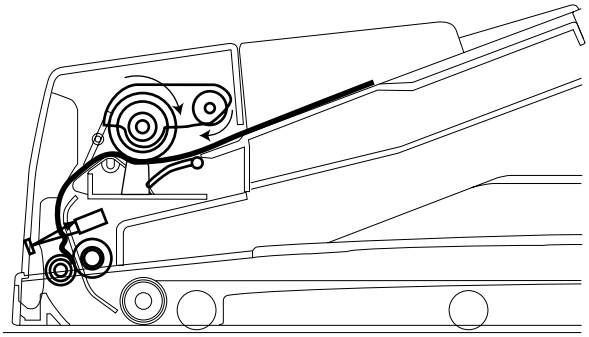

**Figure 2-211**


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## 2. Moving Up the Pickup Roller Unit

The pickup roller and the lifter are designed to operate (move up and down) in conjunction with the separation motor (M1).

### ■ Separation Motor Rotating Counterclockwise

When the separation motor rotates counterclockwise, the work of a cam disengages the lock used to keep the pickup roller in place, and the pickup roller starts to move down on its own weight.

In addition, the drive reaches the arm of the lifter, causing the lifter to move up. This operation moves up the originals while they are held intact in preparation for pickup operation.

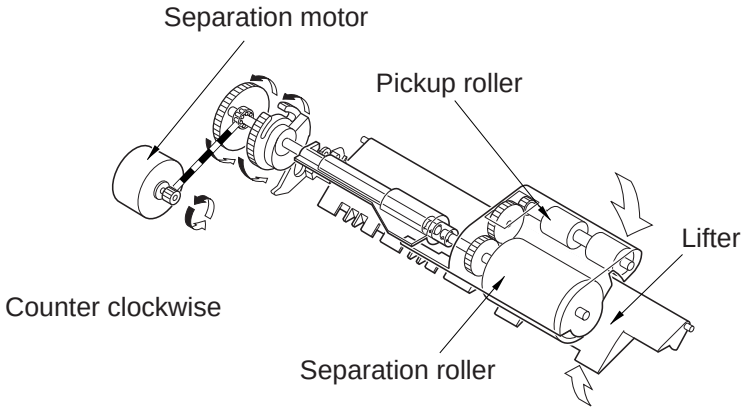


**Figure 2-212**

When the separation motor (M1) rotates clockwise, the work of the cam moves down the lifter, and then the pickup roller returns to the ascent position. When the separation motor is rotating clockwise, the work of the one-way clutch lets the rotation drive of the separation motor (M1) to reach the separation roller and the pickup roller. When the separation motor rotates counterclockwise, its rotation drive will not reach the separation roller or the pickup roller.

### ■ Separation Motor Rotating Clockwise

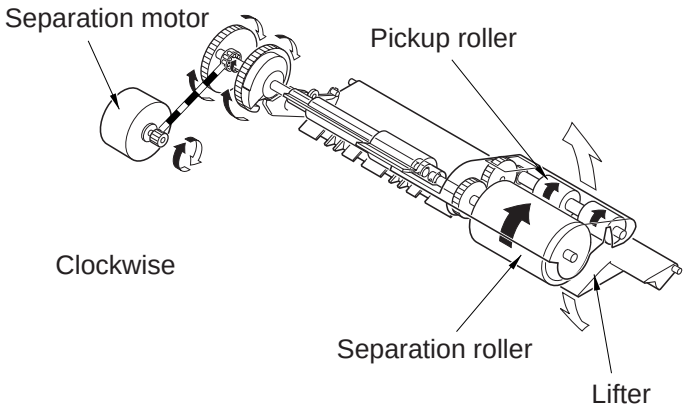


**Figure 2-213**

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1. When the copier's Copy Start key is pressed, the separation motor (M1) starts to rotate counterclockwise. In response, the lock used to keep the pickup roller in place becomes disengaged, and the pickup roller falls down on the original on its own weight.
   The work of a cam, on the other hand, moves up the lifter and, consequently, the original.
   The separation motor rotates counterclockwise
   for 250 msec and then stops to end ascent.

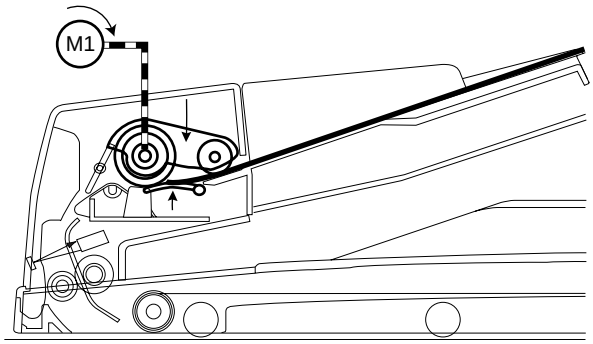


**Figure 2-214**

2. When the pickup roller stops moving down and the lifter stops moving up, the separation motor starts to rotate clockwise so that its rotation drives the separation roller and the pickup roller, moving the first original to the separation assembly.

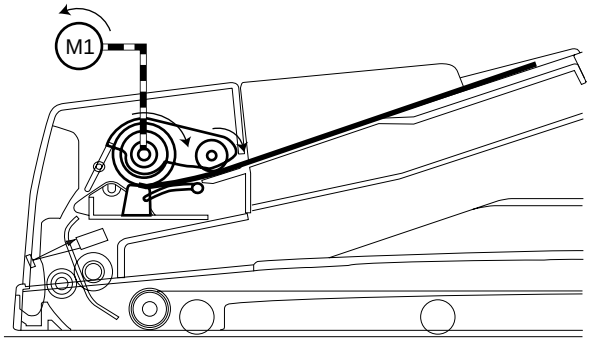


**Figure 2-215**

3. A moment after the separation motor starts to rotate clockwise, the lifter starts to move down by the work of the cam.
   Then, the pickup roller starts to move up while rotating, returning to its initial position.

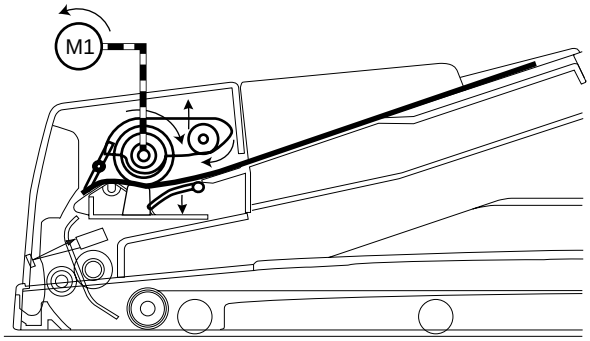


**Figure 2-216**

4. When the pre-registration sensor (U502) detects the trailing edge of the original (OFF), the separation motor starts to rotate counterclockwise once again. In response, the lock used to keep the pickup roller in place becomes disengaged, and the pickup roller falls down onto the original on its own weight.
   The work of the cam, on the other hand, moves up the lifter to hold up the original.

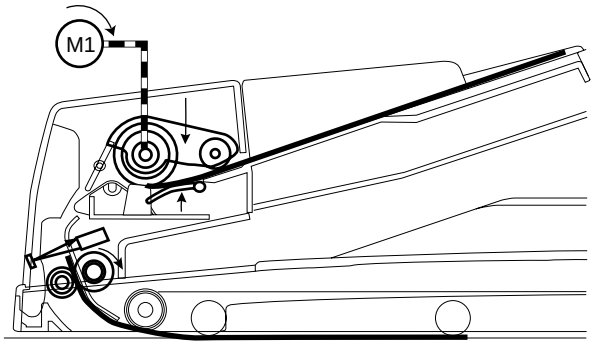


**Figure 2-217**


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### 3. Separation Sensor (SR3)

The original feeding path is equipped with a separation sensor (SR3) to monitor the movement of originals.

If the separation sensor does not detect an original a specific time after the separation motor has started to rotate clockwise to move an original, the ADF controller will assume the condition as a separation fault (delay), and will stop the machine and cause the copier to indicate the Jam message.

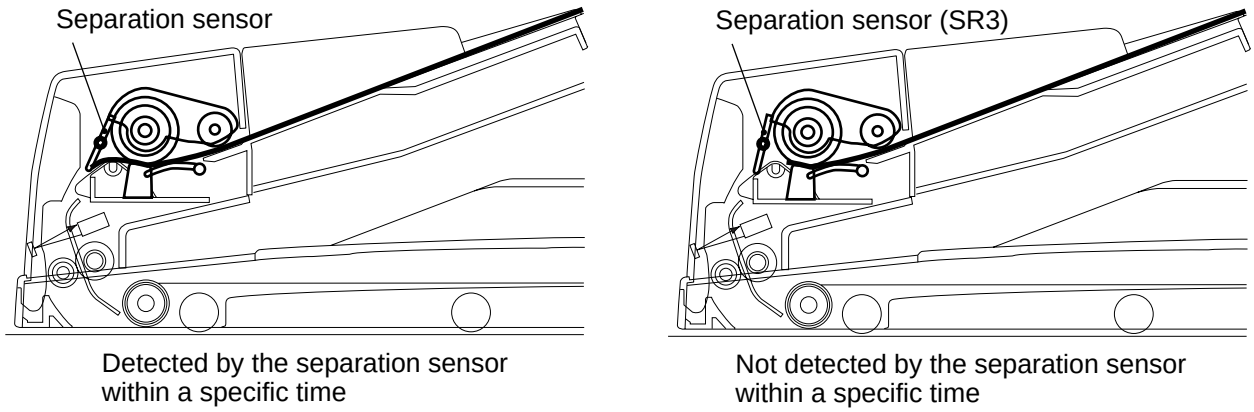
Separation sensor
Separation sensor (SR3)
Detected by the separation sensor within a specific time
Not detected by the separation sensor within a specific time

**Figure 2-218**

## 4. Controlling the Separation Motor (M1)

Figure 2-219 is a diagram of the control circuit used for the separtion motor (M1).

The separation motor is a DC motor, and the CPU (Q1) on the ADF controller PCB sends the separation motor rotation speed control signal (SMPWM) and the separation motor rotation direction signal (SMFWD, SMREV) to the drive circuit, which in response drives the separation motor.

The control circuit does no possess a circuit designed to communicate the state of the separation motor back to the CPU (Q1). The rotation speed control signal (SMPWM) remains the same at all times, and no correction is made even when changes occur in the rotation speed of the separation motor because of external force.

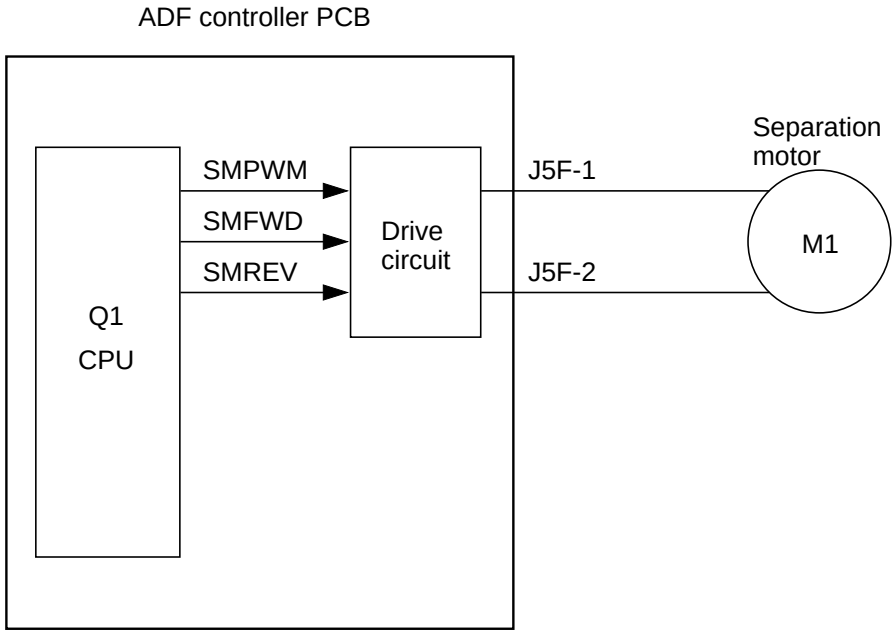


**Figure 2-219**

The relationship between the separation motor rotation speed control signal (SMPWM), the separation motor rotation direction signal (SMFWD, SMREV), and the separation motor is as shown in Table 2-204.

| Separation motor rotation speed control signal (SMPWM) | Separation motor rotation direction signal (SMFWD) | Separation motor rotation direction signal (SMREV) | Separation motor operation |
|---|---|---|---|
| '0' | '0' | '0' | Stops |
| '1' | '0' | '1' | Rotates CW |
| '1' | '1' | '0' | Rotates CCW |

**Table 2-204**


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## 5. Sequence of Operations (pickup assembly)

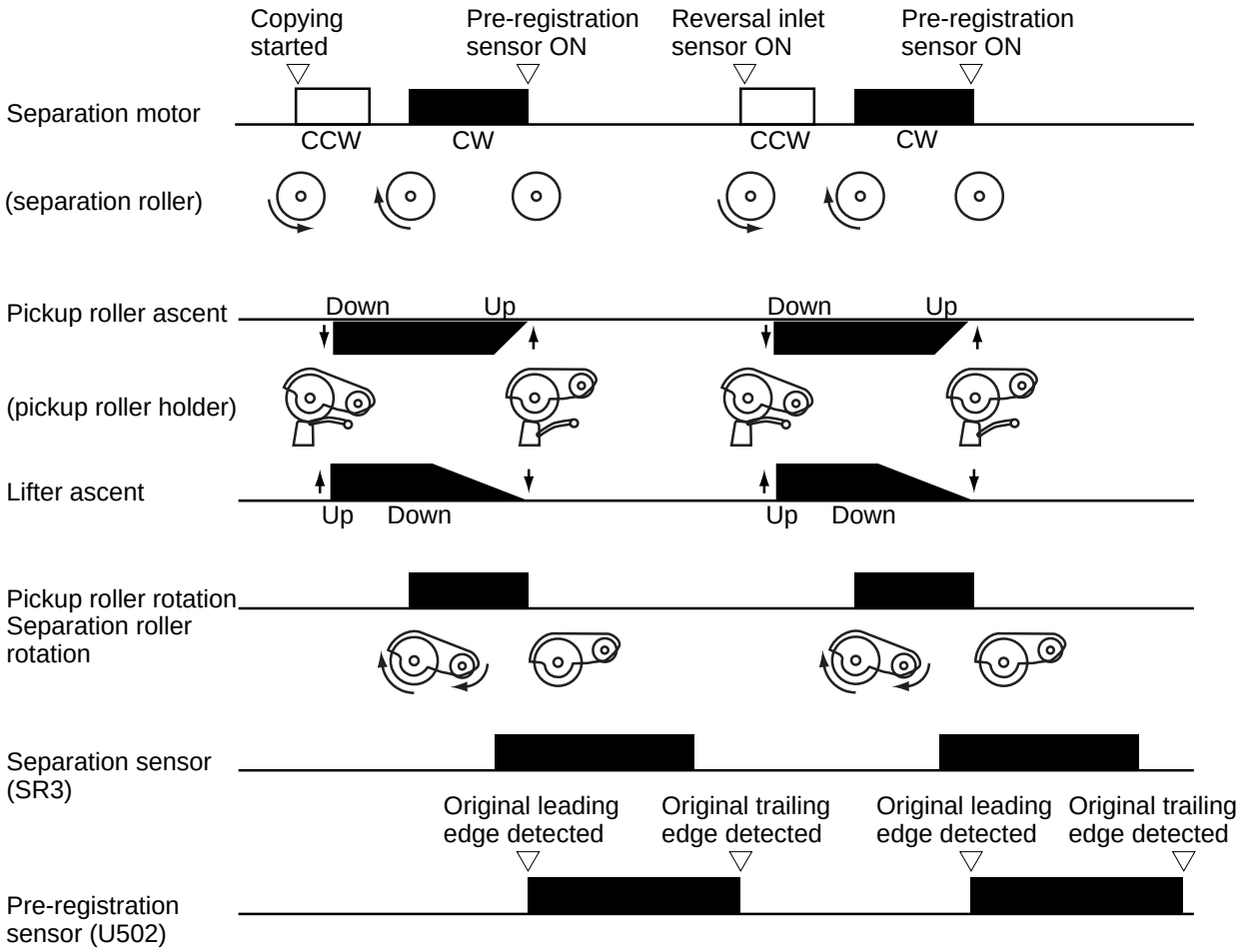


**Figure 2-220**

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# D. Moving Originals

## 1. Outline

The drive of the feed motor (M2) is used to rotate the registration roller and the feed belt drive roller, thereby moving originals.

Originals are moved in normal or reverse direction according to the size of the original (small, large) and operating mode (single-sided, double-sided).

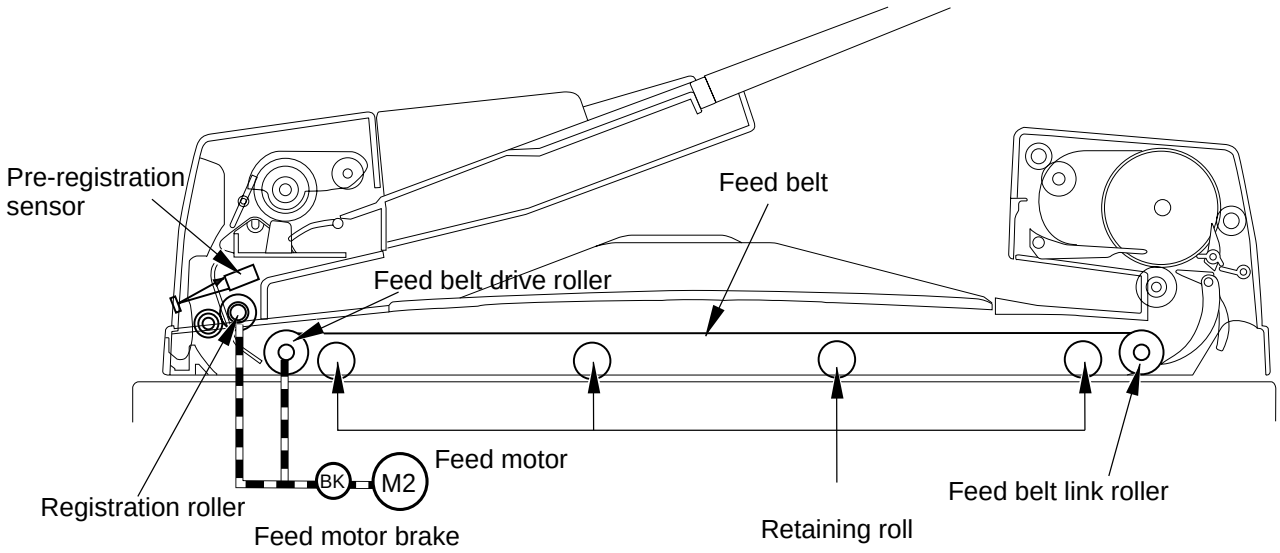


**Figure 2-221**


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1. Starting to Move an Original

When an original has been picked up and moved to the separation assembly, the feed motor (M2) is rotated clockwise. Its drive reaches the registration roller and the feed belt link roller, and the original is moved to the copyboard glass.

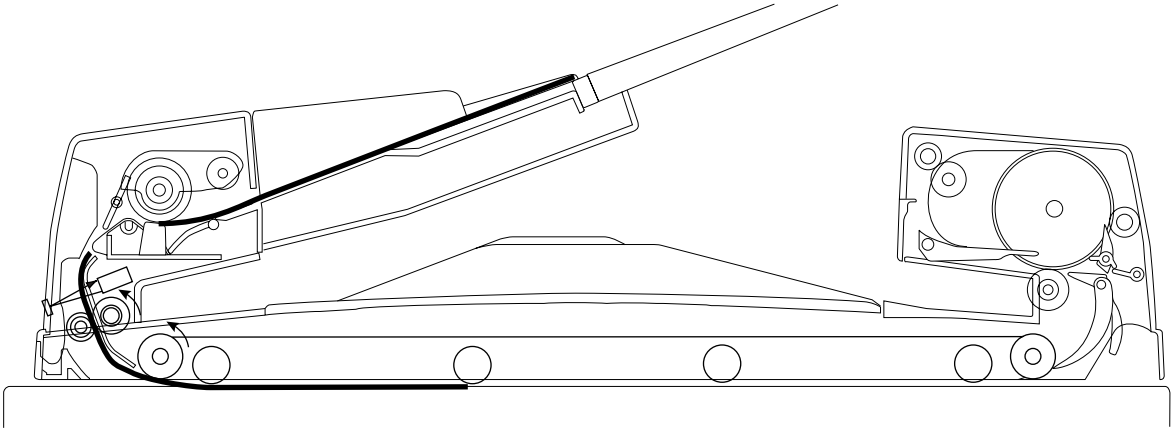

**Figure 2-222**

2. Slowing Down the Movement

When the pre-registration sensor (U502) detects the trailing edge of an original (OFF), the length (in feeding direction) of the original is computed from the time of detection by the pre-registration sensor and the number of clocks from the feed motor.

At the same time, the movement is decelerated gradually so that the trailing edge of the original is moved to the image leading edge position on the copyboard glass.

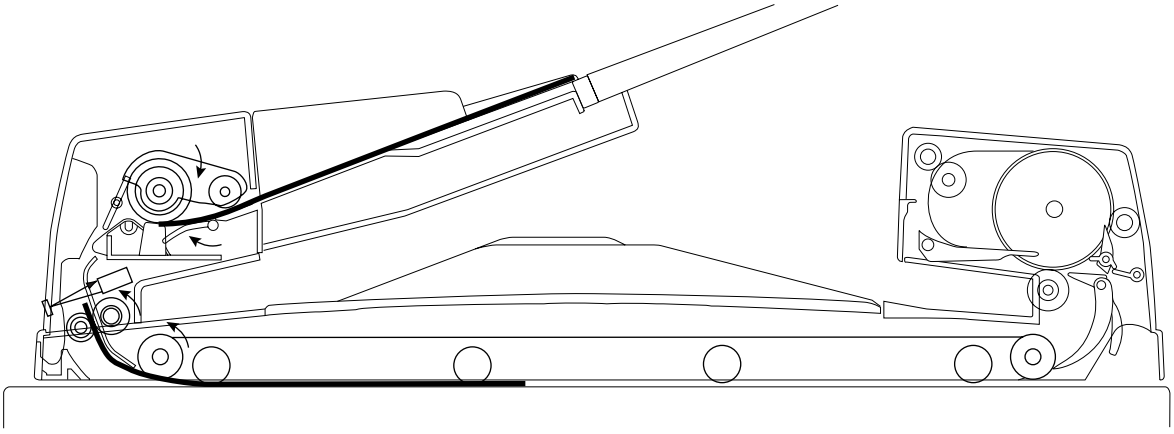

**Figure 2-223**

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3. Stopping the Movement (start of copying)

When the original reaches the image leading edge position on the copyboard glass, the feed motor brake (CL) is turned on to stop its movement.

If the original is a small-size original (continuous feeding), the next original is picked up at that point in time, and is butted against the registration roller.

If the original is a large-size original (or mixed sizes), the next original is picked up when the scanner ended its forward movement.

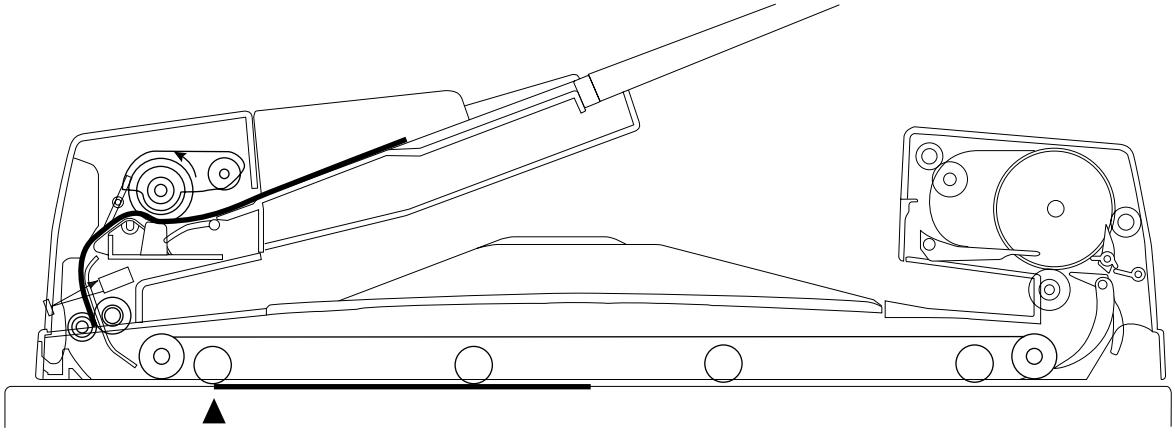

**Figure 2-224**

4. Starting Delivery (end of copying)

When the copier has ended its scanning operation, the feed motor (M2) is rotated clockwise once again to rotate the registration roller and the feed belt drive roller so that the original is moved to the reversal delivery assembly.

If the original is a small-size original (continuous feeding), the original is moved to the right half of the copyboard glass; if it is a large-size original, on the other hand, it is moved to the reversal delivery assembly.

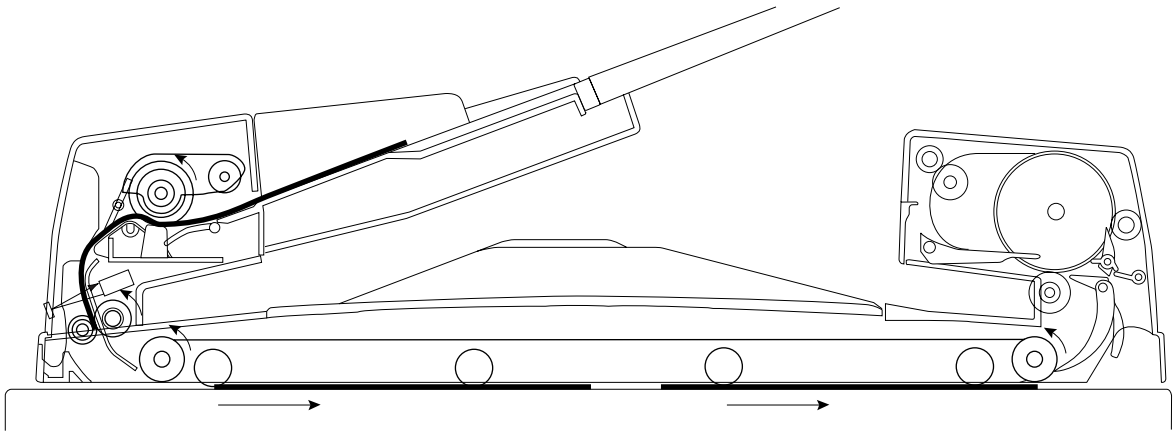

**Figure 2-225**


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## 2. Controlling the Feed Motor (M2)

Figure 2-225 is a diagram of the control circuit used for the feed motor (M2).

The feed motor is a DC motor. The CPU (Q1) on the ADF controller PCB sends the feed motor rotation speed control signal (FMPWM) and the feed motor rotation direction signal (FMFWD, FMREV) to the drive circuit, which in response drives the feed motor.

When the feed motor (M1) starts to rotate, the feed motor clock sensor (SR1) turns on to send the feed motor lock signal (FMCK) to the CPU (Q1). In response, the CPU (Q1) compares the rotation speed that has been selected in advance and the feed motor clock signals (FMCK), and varies the feed motor rotation speed control signal (FMPWM) to enable the selected speed.

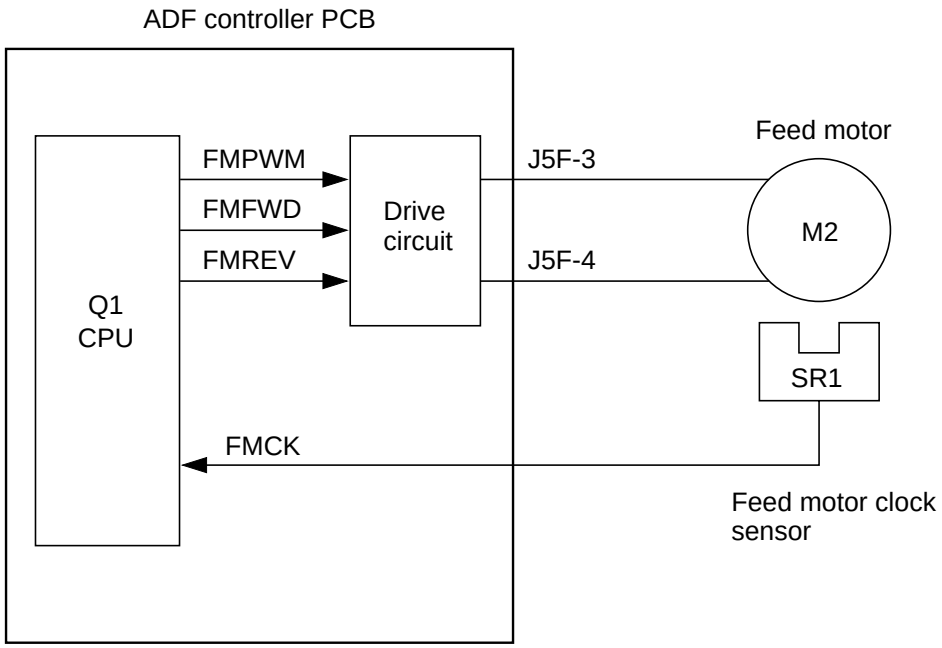


**Figure 2-226**

The relationship between the feed motor rotation speed control signal (FMPWM), feed motor rotation direction signal (FMFWD, FMREV), and feed motor is as follows:

| Feed motor rotation speed control signal (FMPWM) | Feed motor rotation direction signal (FMFWD) | Feed motor rotation direction signal (FMREV) | Feed motor operation |
|---|---|---|---|
| '0' | '0' | '0' | Stops |
| '1' | '0' | '1' | Rotates CW |
| '1' | '1' | '0' | Rotates CCW |

**Table 2-205**

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## 3. Sequence of Operations (feeding assembly)

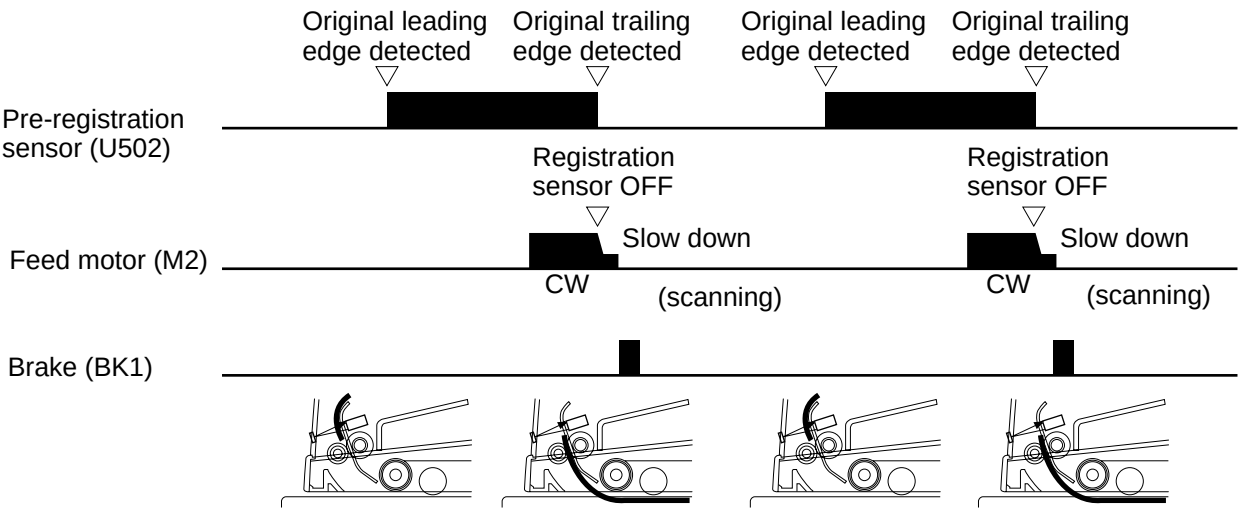


**Figure 2-227**


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# E. Turning Over an Original/Delivery

## 1. Outline

An original is delivered by the reversal delivery roller and the reversal delivery link roller using the drive of the reversal delivery motor (M3).

The ADF moves an original by the reversal delivery roller in feeding direction, switches the feeding path, and rotates the reversal delivery motor counterclockwise to start delivery. In other words, originals are delivered to the delivery tray face down, starting with the first page.

The feeding path is switched by opening and closing two flappers. The reversal delivery registration sensor and the delivery sensor operate in conjunction with the two levers located in the feeding path, and turn on or off according to the direction of rotation of the reversal delivery motor.

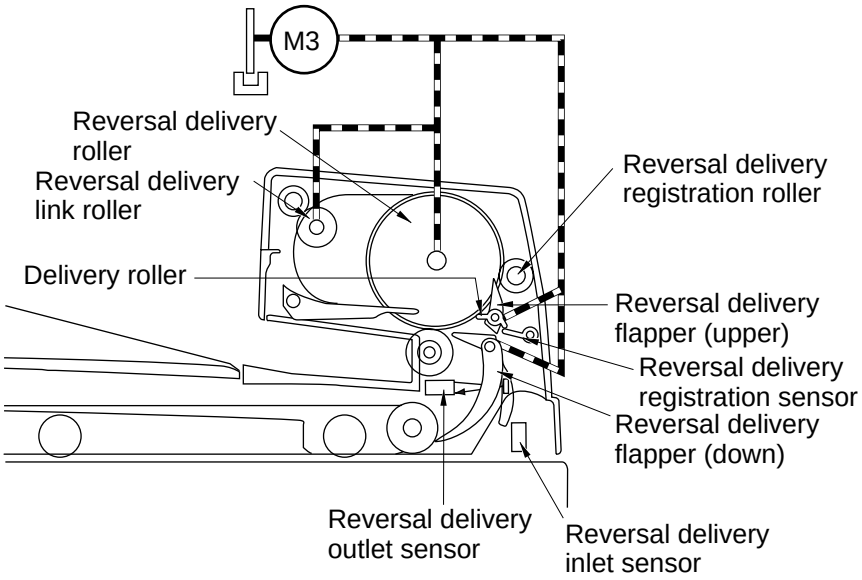


**Figure 2-228**

a. Small-Size (A5, A4, B5, STMT, LTR)

If the original is a small-size original, the reversal delivery motor (M3) is rotated clockwise so that the original is moved to the small-size switch-back position; then, it is delivered to the delivery tray face down by rotating the reversal delivery motor counterclockwise.

1. Starting Delivery

When the copier ends scanning, the original on the copyboard glass is moved to the reversal delivery assembly by rotating the feed motor (M2) clockwise once again.

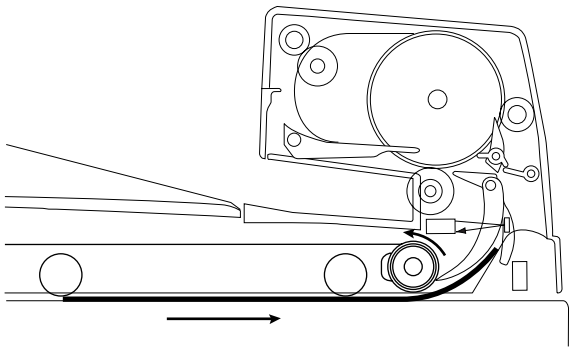

**Figure 2-229**

2. Delivery (clockwise rotation)

When the reversal delivery registration sensor (SR5) detects the leading edge of an original (ON), the reversal delivery motor (M3) rotates clockwise to move the original to the reversal delivery assembly.

At this time, the reversal delivery motor is rotated clockwise so that the original is moved to the path where the flapper is closed.

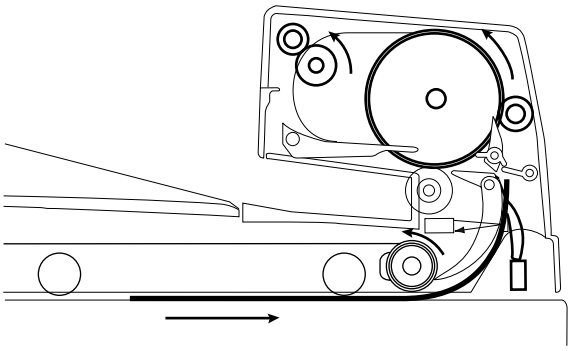

**Figure 2-230**

3. Delivery (counterclockwise rotation)

When the reversal delivery registration sensor (SR5) detects the leading edge of an original (OFF), the reversal delivery motor (M3) moves the original over a specific distance (until the leading edge of the original reaches the switch-back position), and stops.

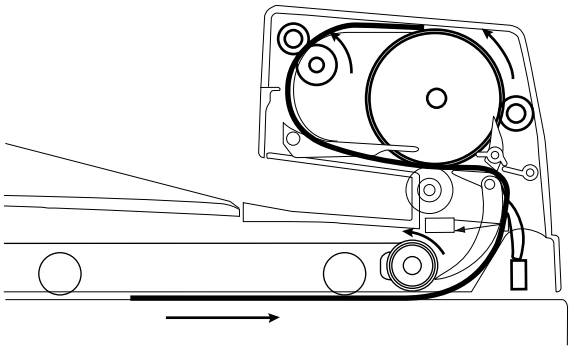

**Figure 2-231**


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4. Controlling Deceleration

The reversal delivery motor (M3) starts to move counterclockwise when the original reaches and stops at the switch-back position. The reversal delivery motor rotates counterclockwise, and the original is moved to the feeding path where the flapper is open.

The reversal delivery motor is controlled for deceleration when an original has been moved over a specific distance after the delivery sensor (SR5) detects its leading edge.

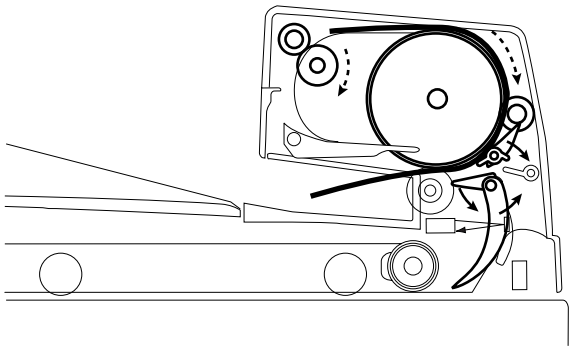

**Figure 2-232**

5. End of Delivery

The reversal delivery motor (M3) is decelerated, and then is rotated counterclockwise until the original reaches the delivery tray (face down), at which time it is stopped.

When the reversal delivery motor has stopped, it is rotated clockwise once again for an equivalent of 60 mm to close the flapper.

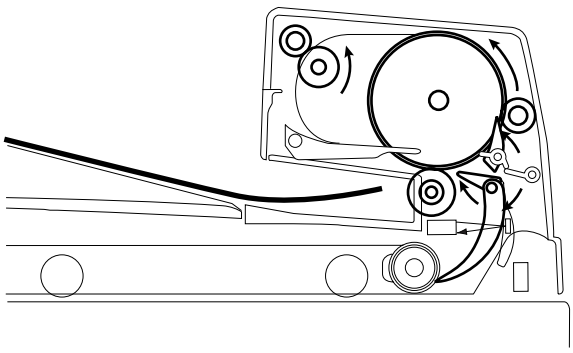

**Figure 2-233**

b. Large-Size Originals (A4R, B5R, A3, B4, LTRR, LGL, 11X17)

If the original is a large-size original, the reversal delivery motor (M3) is rotated clockwise to move the original to the large-size reversal position; then, the reversal delivery motor is rotated counterclockwise to move the original to the delivery tray face down.

1. Start of Delivery

When the copier ends scanning operation, the original on the copyboard glass is moved to the reversal delivery assembly by rotating the feed motor (M2) clockwise once again.

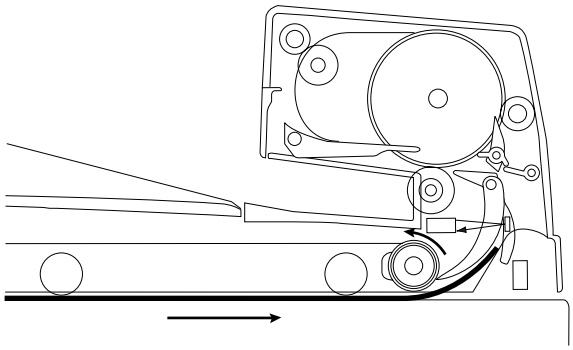

**Figure 2-234**

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2. Delivery (clockwise rotation)

When the reversal delivery inlet sensor (SR4) detects the leading edge of an original (ON), the reversal delivery motor (M3) rotates clockwise to move the original to the reversal delivery assembly.

At this time, the reversal delivery motor rotates clockwise so that the original is moved to the paper path where the flapper is closed.

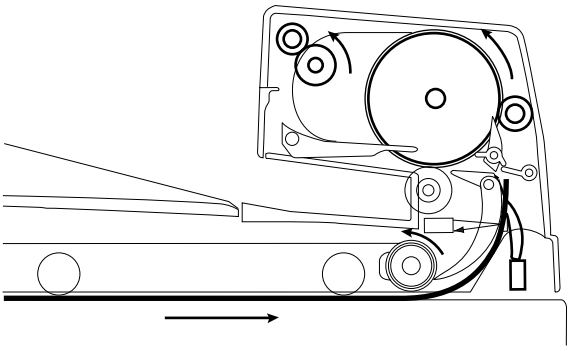

**Figure 2-235**

3. Start of Reversal

When the reversal outlet sensor (U505) detects the leading edge of an original (ON), the feed motor (M2) rotates to move the original back to the original glass.

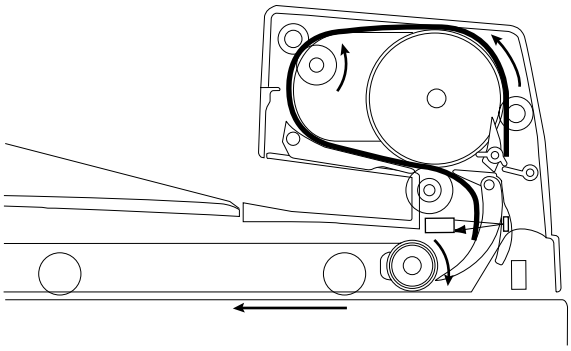

**Figure 2-236**

4. End of Reversal

When the reversal outlet sensor (U505) detects the trailing edge of an original (OFF), the feed motor (M2) moves the original over a specific distance (until the leading edge of an original reaches the reversal stop position, and stops.

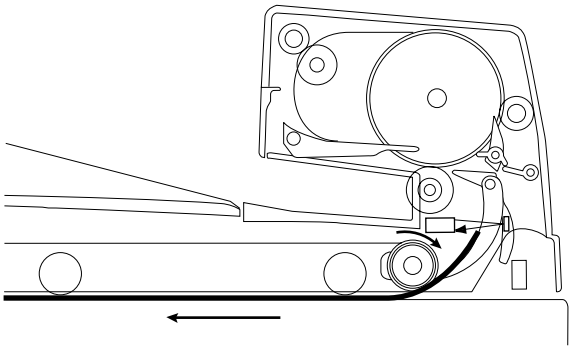

**Figure 2-237**

5. Switching the Feeding Path

When the original has stopped at the reversal stop position, the reversal delivery motor (M3) is rotated counterclockwise for an equivalent of 60 mm to keep the flapper open.

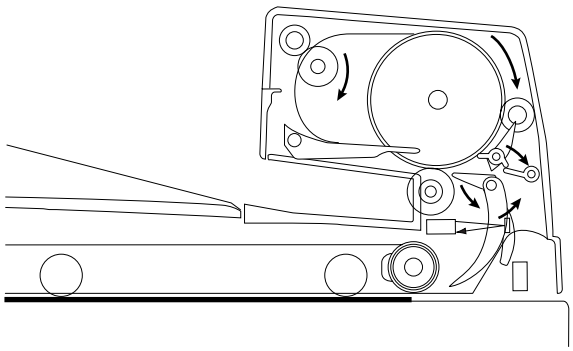

**Figure 2-238**


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### 6. Deceleration Control

When the flapper opens, the feed motor (M2) starts to move clockwise, and the reversal delivery motor (M3) starts to move counterclockwise to deliver the original to the delivery tray.

When the reversal inlet sensor (SR4) detects the leading edge of an original (ON), the feed motor starts counting; as soon as the original leaves the retaining roll, the count is incremented, and the reversal delivery motor (M3) is subjected to deceleration control.

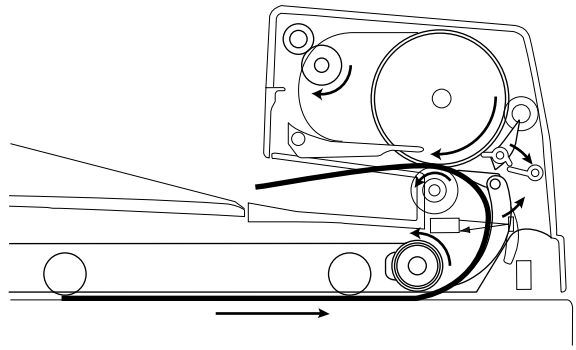

**Figure 2-239**

### 7. End of Delivery

After deceleration control, the reversal delivery motor (M3) rotates counterclockwise until the original reaches the delivery tray (face down), at which time it stops.

The reversal delivery motor stops, and then it rotates for an equivalent of 60 mm once again to close the flapper.

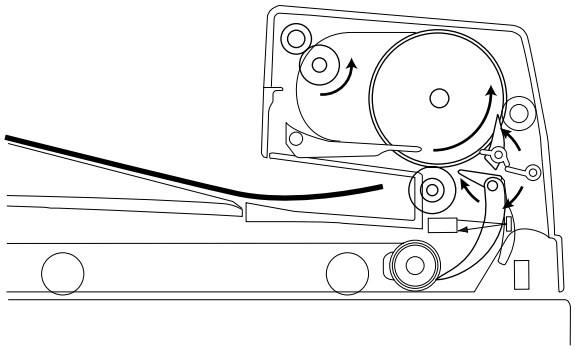

**Figure 2-240**

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## 2. Operation of the Reversal Delivery Flapper

The reversal delivery flapper consists of three flappers as shown, and operates (opens and closes) in conjunction with the reversal delivery motor (M3).

When the reversal delivery motor rotates counterclockwise, the flapper opens; when the motor rotates clockwise, on the other hand, it closes, switching the feed path.

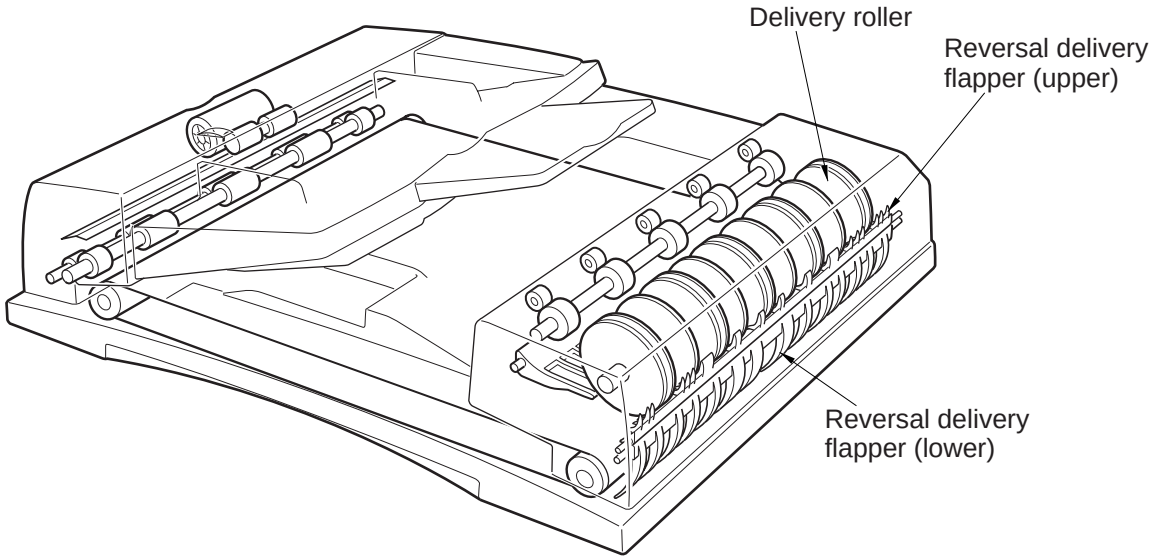


**Figure 2-241**

### ■ Reversal Delivery Motor Clockwise Rotation

When the reversal delivery motor (M3) rotates clockwise, the three flappers close, and the paper path will be as follows:

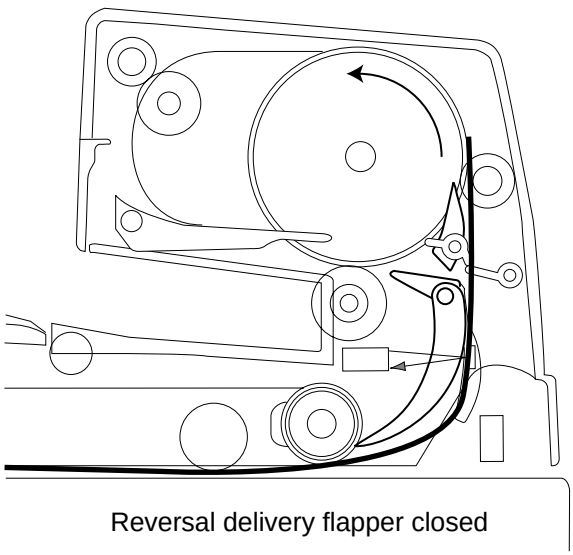


**Figure 2-242**

### ■ Reversal Delivery Motor (counterclockwise rotation)

When the reversal delivery motor (M3) rotates counterclockwise, the three flappers open, and the paper path will be as follows:

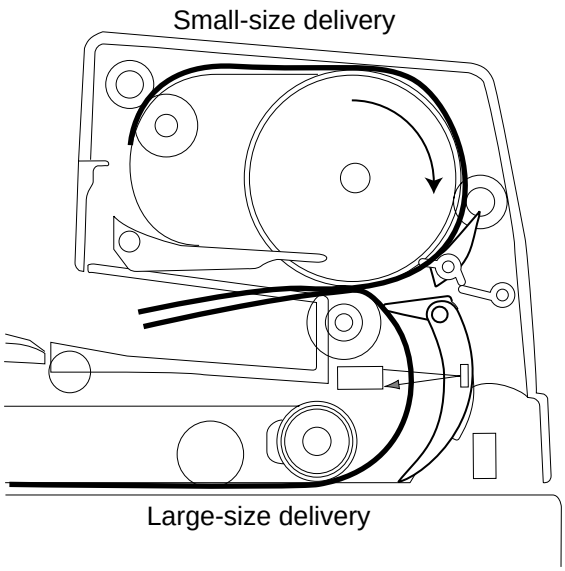


**Figure 2-243**


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### 3. Controlling the Reversal Delivery Motor (M3)

Figure 2-243 is a diagram of the control circuit used for the reversal delivery motor (M3).

The reversal delivery motor is a DC motor. The CPU (Q1) on the ADF controller PCB sends the reversal delivery motor rotation speed control signal (EMPWM) and the reversal delivery motor rotation direction signal (EMFWD, EMREV) to the drive circuit, which in response drives the reversal delivery motor.

When the reversal delivery motor (M3) rotates, the reversal delivery motor clock sensor (SR7) turns on to send the reversal delivery motor clock signal (EMCK) to the CPU (Q1).

The CPU (Q1) compares the rotation speed selected in advance and the reversal delivery motor clock signal (FMCK), and varies the reversal delivery motor rotation speed control signal (EMPWM) to suit the selected speed.

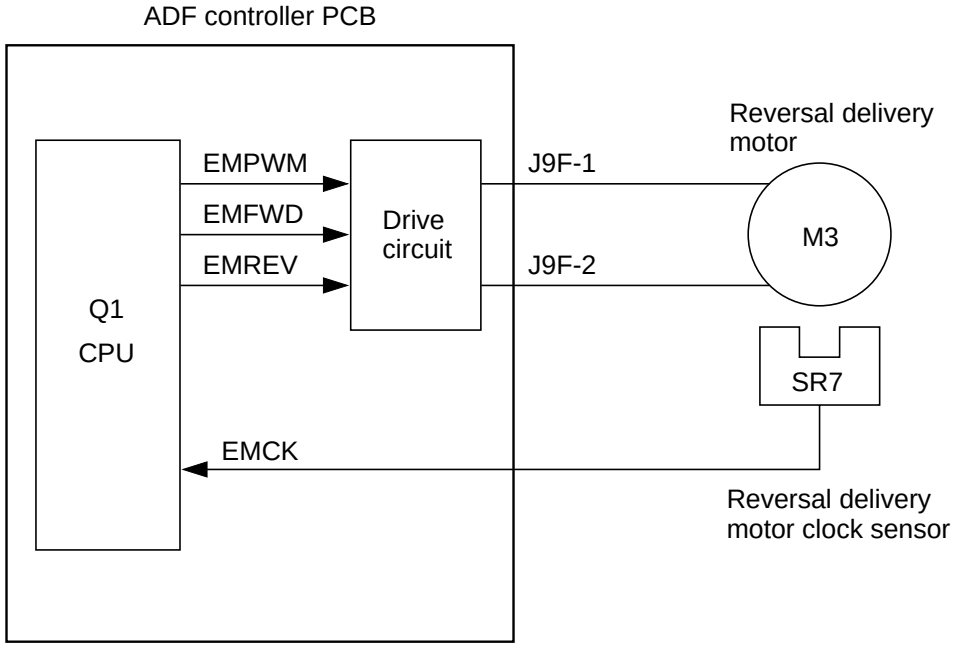


**Figure 2-244**

The relationship between the reversal delivery motor rotation speed control signal (EMPWM), reversal motor rotation direction signal (EMFWD, EMREV), and reversal delivery motor is as follows:

| Reversal delivery motor rotation speed control signal (EMPWM) | Reversal delivery motor rotation speed signal (EMFWD) | Reversal delivery motor rotation direction signal (EMREV) | Reversal delivery motor operation |
|---|---|---|---|
| '0' | '0' | '0' | Stops |
| '1' | '0' | '1' | Rotates CW |
| '1' | '1' | '0' | Rotates CCW |

**Table 2-206**

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## 4. Sequence of Operations (reversal delivery assembly)

a. Small-Size Originals

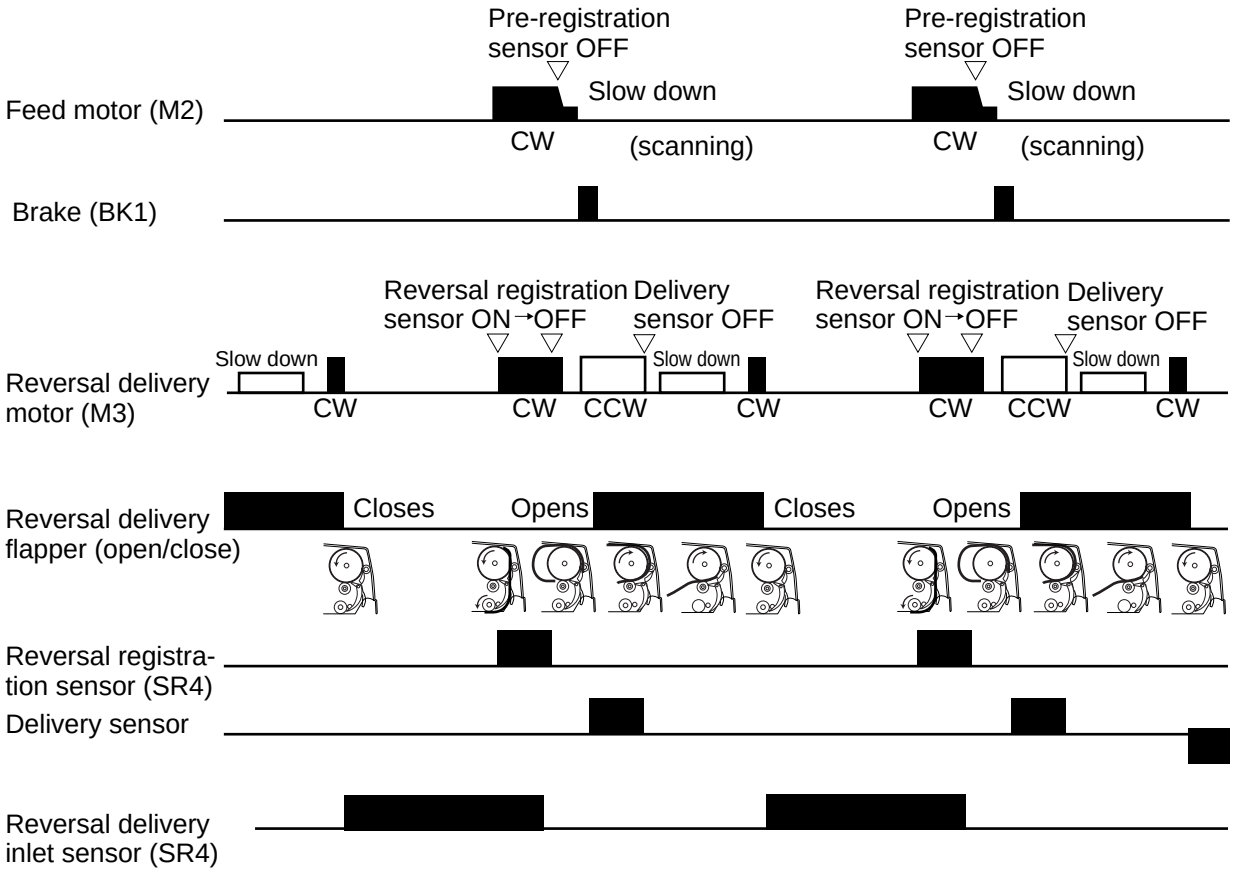


**Figure 2-245**


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b. Large-Size Originals

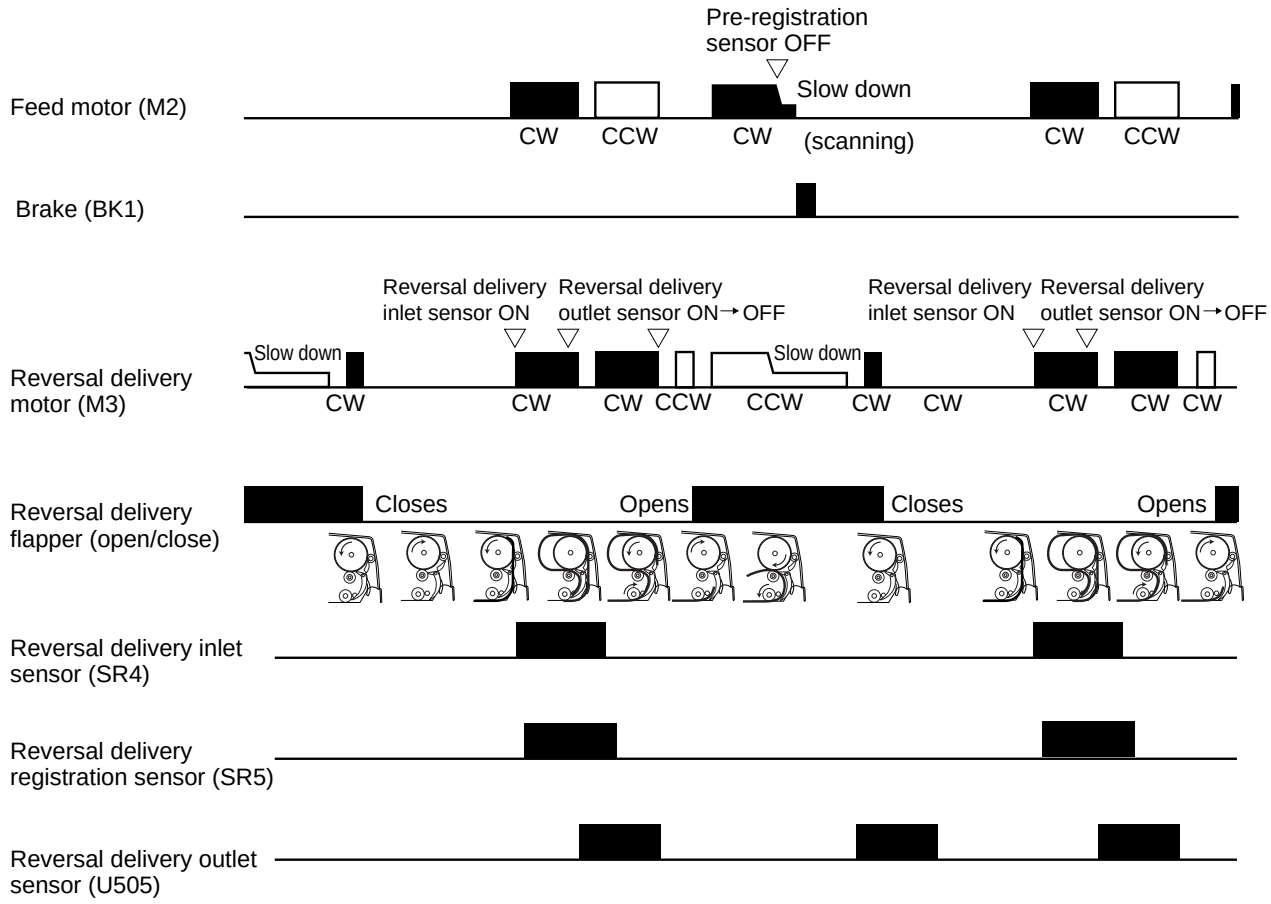


**Figure 2-246**

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# F. Movement of Originals

## 1. Small-Size Originals (continuous feeding, single-sided)

When making single-sided copies of small-size originals, the second original is picked up as soon as the first original is sent to the copyboard glass.

The original sent to the copyboard glass is scanned, and then moved to the right, while the next original is sent to the copyboard glass.

1. When the Copy Start key is pressed, the separation motor (M1) rotates counterclockwise for a limited time, causing the pickup roller to move down and the lifter to move up (in wait for pickup).

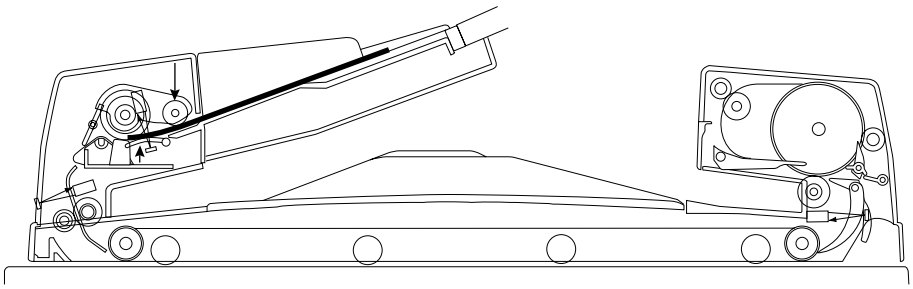

**Figure 2-247**

2. The separation motor (M1) stops once, and then starts to rotate clockwise so that the separation roller and the pickup roller rotate to separate the first original.
   The lifter starts to move down, and then the pickup roller starts to move up.
   The separation motor stops when the pre-registration sensor (U502) detects the leading edge of an original (ON).

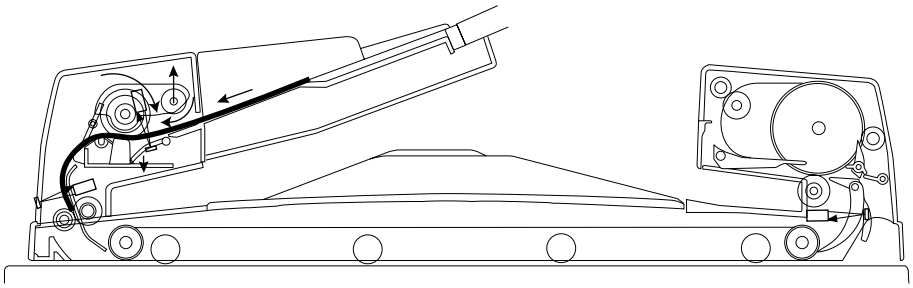

**Figure 2-248**

3) The feed motor (M2) rotates clockwise, and the original is moved to the copyboard glass. When the pre-registration sensor (U502) detects the trailing edge of an original (OFF), the ADF is in wait for pickup of the next original.

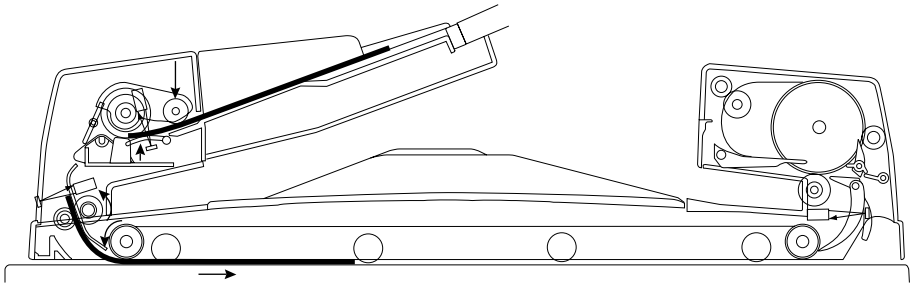

**Figure 2-249**


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4. When the pre-registration sensor (U502) detects the trailing edge of an original (OFF), the feed motor (M2) starts to slow down.
   The feed motor stops when the trailing edge of the original reaches the image leading position, and scanning starts when the original reaches a specific position. At this time, the next original is put through separation operation.

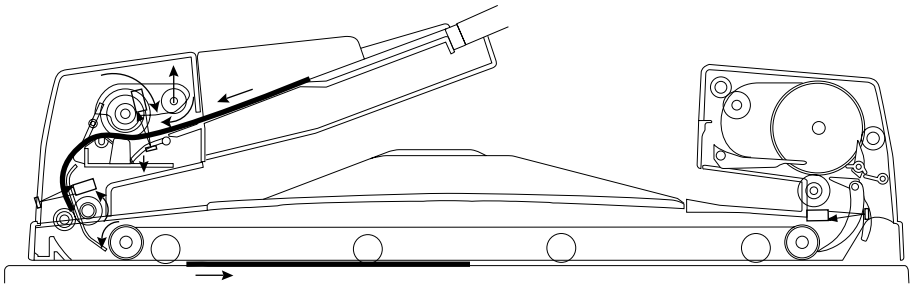

**Figure 2-250**

5. When the first original has been scanned, the feed motor (M2) rotates clockwise to move the original to the right. At the same time, the next original is moved to the copyboard glass.
   When the pre-registration sensor (U502) detects the trailing edge of the next original (OFF), the feed motor (M2) starts to slow down.
   The feed motor stops when the trailing edge of the next original reaches the image leading edge position, and scanning starts when the next original reaches a specific position.

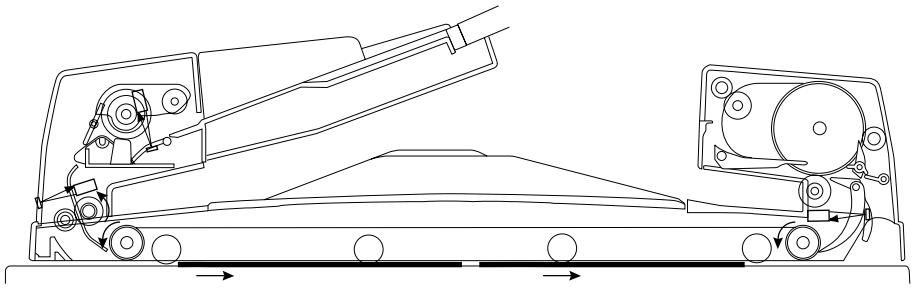

**Figure 2-251**

6. When the reversal delivery registration sensor (SR5) detects the leading edge of an original (ON), the reversal delivery motor (M3) starts to rotate clockwise. When the reversal delivery motor is rotating clockwise, the reversal delivery flapper remains closed.

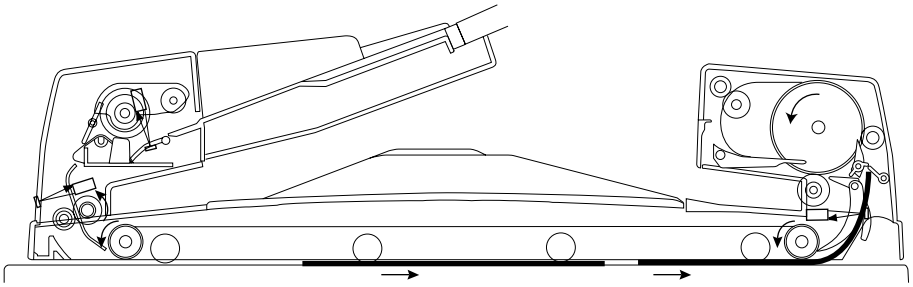

**Figure 2-252**

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7. When the reversal delivery registration sensor (SR5) detects the leading edge of the original (OFF), the reversal delivery motor (M3) moves the original over a specific distance (to the switch-back position), stops, and starts to rotate counterclockwise.
When the reversal delivery motor rotates counterclockwise, the reversal delivery flapper opens to switch the paper path.

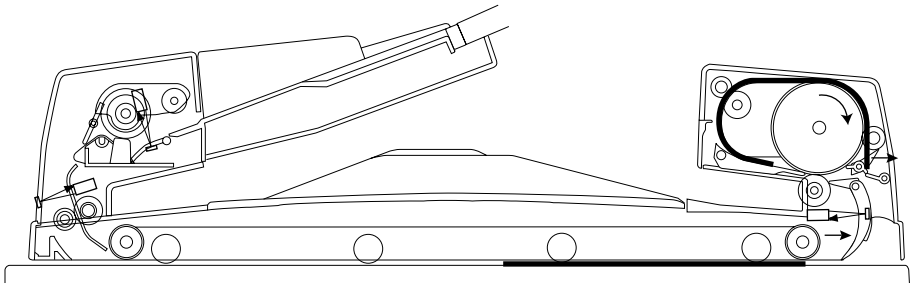

**Figure 2-253**

8. The reversal delivery motor (M3) rotates counterclockwise so that the first original is sent to the delivery tray. The reversal delivery motor starts to slow down when the delivery sensor (SR5) detects the trailing edge of the original (OFF).

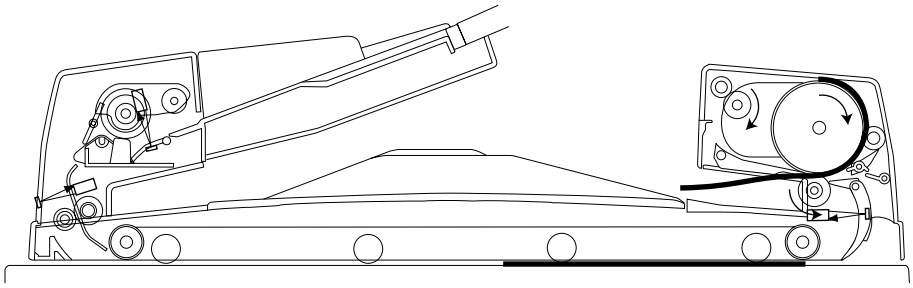

**Figure 2-254**

9. The reversal delivery motor (M3) stops when the original reaches the delivery tray. The reversal delivery motor then stops, and then starts to rotate clockwise for a limited time so that the reversal delivery flapper closes.

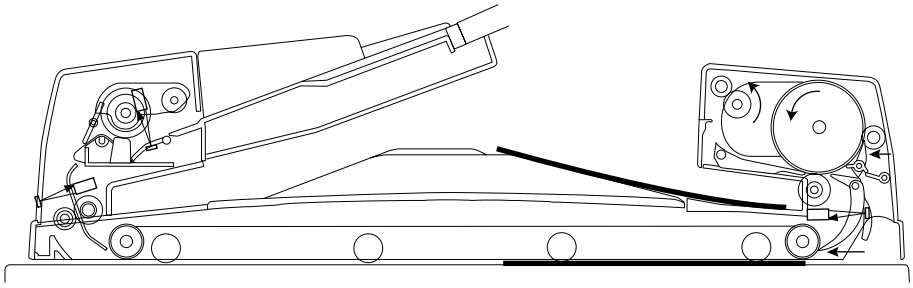

**Figure 2-255**


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## 2. Large-Size Originals (single-sided)

When making single-sided copies of large-size originals, the second original is sent to the copyboard glass after the first original has been delivered. In the case of large-size originals, delivery occurs after the original moved to the reversal delivery assembly is turned over and returned to the copyboard glass.

1. When the Copy Start key is pressed, the separation motor (M1) rotates counterclockwise for a limited time so that the pickup roller moves down and the lifter moves up (in wait for pickup).

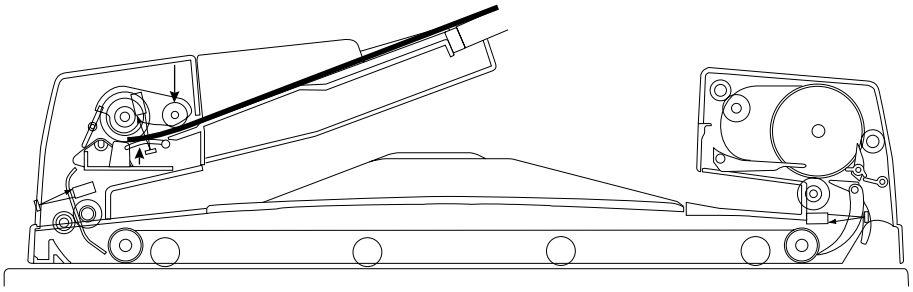

**Figure 2-256**

2. The separation motor (M1) stops once, and then starts to rotate clockwise so that the separation roller and the pickup roller rotate to separate the first original.
   The lifter starts to move down, and then the pickup roller starts to move up.
   The separation motor stops when the pre-registration sensor (U502) detects the leading edge of the original (ON).

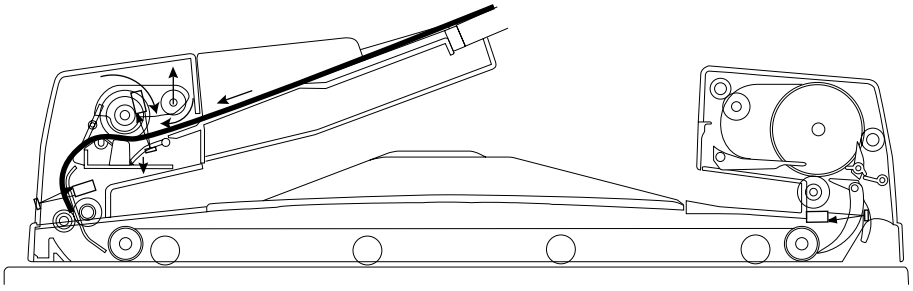

**Figure 2-257**

3. The feed motor (M2) rotates clockwise, and the original is moved to the copyboard glass. When the pre-registration sensor (U502) detects the trailing edge of the original (OFF), the ADF will be in wait for pickup.

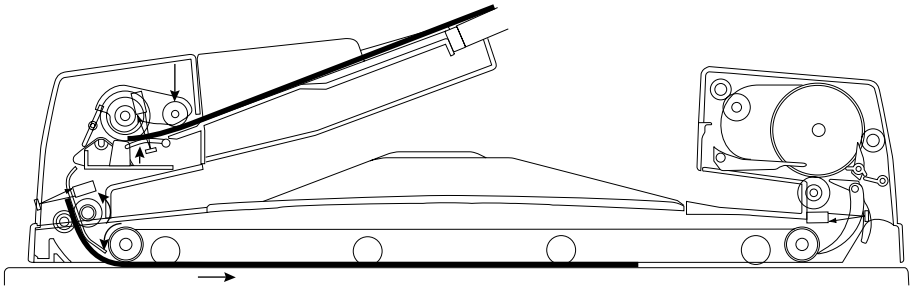

**Figure 2-258**

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4. When the pre-registration sensor (U502) detects the trailing edge of the original (OFF), the feed motor (M2) slows down.
   The feed motor stops when the trailing edge of the original reaches the image leading edge position, and scanning starts when the original reaches and stops at a specific position.

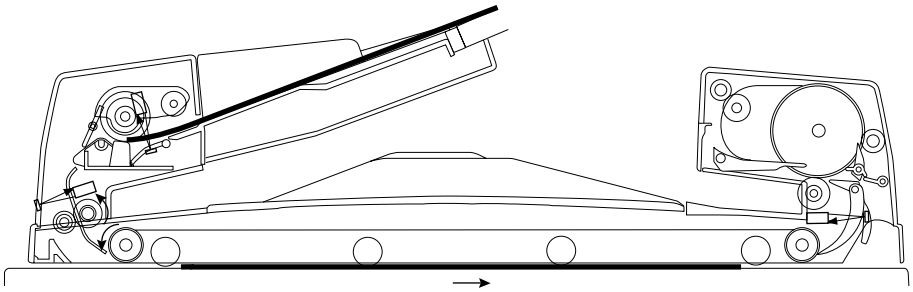

**Figure 2-259**

5. When scanning ends, the 2nd original is separated; the separation motor is stopped once 100 msec after the separation sensor has turned on.
   When the reversal inlet sensor (SR5) detects the leading edge of the original (ON), the reversal delivery motor (M3) starts to rotate clockwise.
   The reversal delivery flapper remains closed while the reversal delivery motor is rotating clockwise.

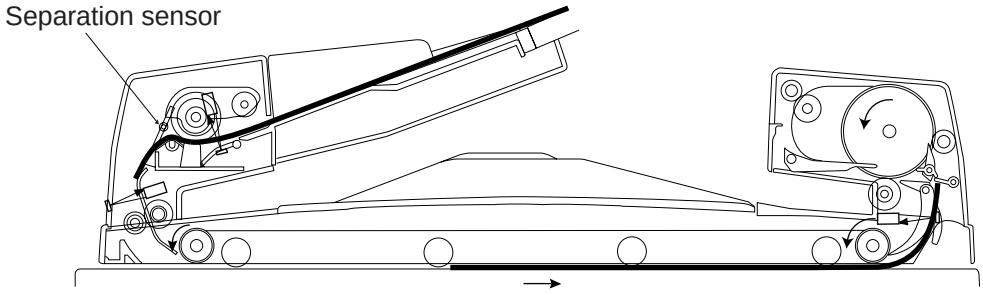


**Figure 2-260**

6. When the reversal delivery outlet sensor (U505) detects the leading edge of the original (ON), the feed motor (M2) stops, and then starts to rotate counterclockwise, moving the original to the copyboard glass.

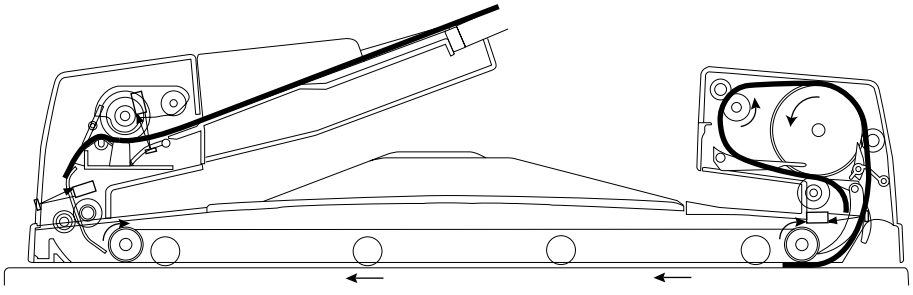

**Figure 2-261**


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7. When the reversal outlet sensor (U505) detects the trailing edge of the original (FF), the feed motor (M2) moves the original over a specific distance (until the trailing edge of the original reaches the reversal stop position), and then stops.
   The feed motor stops once, and then the reversal delivery motor rotates counterclockwise for a limited time so that the reversal delivery flapper opens to switch the paper path.
   The separation motor (M1) rotates clockwise to rotate the separation roll and the pickup roller, thereby separating the first original.

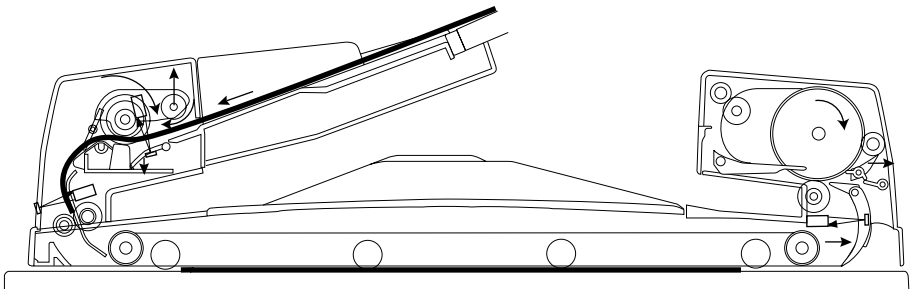

**Figure 2-262**

8. When pickup ends, the feed motor (M1) starts to rotate clockwise; the reversal delivery motor (M3), on the other hand, starts to rotate counterclockwise.
   The first original is sent to the delivery tray, and at the same time the next original is moved to the copyboard glass.
   When the reversal delivery inlet sensor (SR4) detects the leading edge of the original (ON), and the original has been moved over a specific distance, the reversal delivery motor starts to slow down.

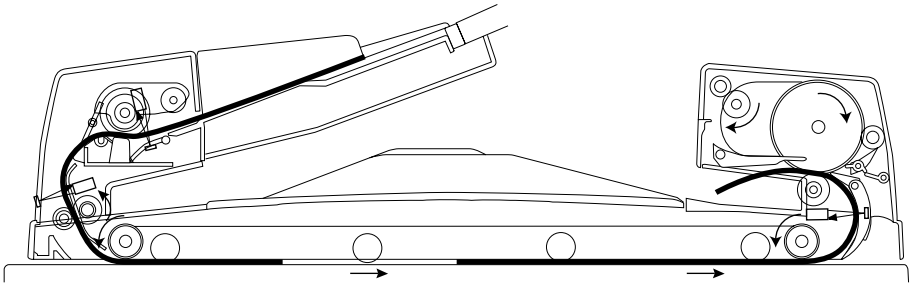

**Figure 2-263**

9. When the pre-registration sensor (U502) detects the trailing edge of the next original (OFF), the feed motor (M2) slows down; the motor stops when the trailing edge of the next original reaches the image leading edge position.
   When the reversal delivery inlet sensor (SR4) detects the leading edge of the first original, and the original is moved over a specific distance, the reversal delivery motor (M3) slows down and stops when the original reaches the delivery tray.
   The reversal delivery motor stops once, and then rotates clockwise so that the reversal delivery flapper closes.

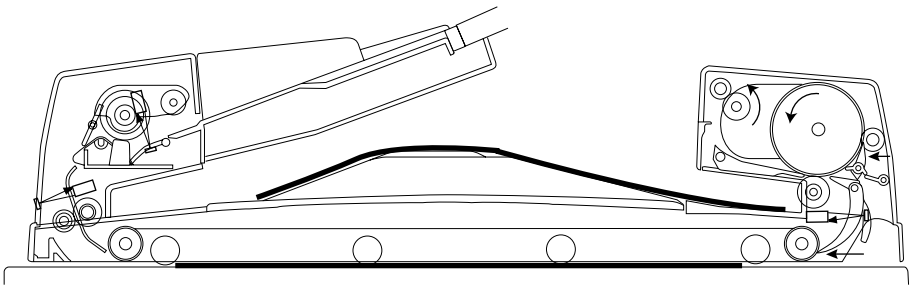

**Figure 2-263**

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### 3. Duplexing Copying Mode

When making double-sided copies, the face of an original is scanned, and the original is turned over while it is moved through the reversal delivery assembly; thereafter, the original is returned to the pre-registration sensor (U502) once, and matched against the image leading edge position on the copyboard glass, and its back is scanned before delivery.

1. When the Copy Start key is pressed, the separation motor (M1) rotates counterclockwise for a limited time so that the pickup roller moves down and the lifter moves up (in wait for pickup).

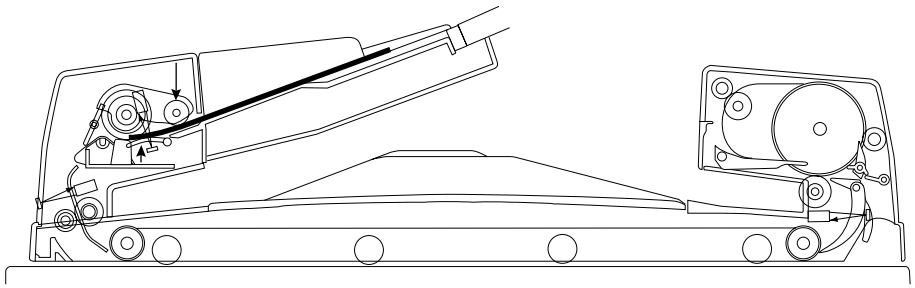

**Figure 2-265**

2. The separation motor stops once, and then starts to rotate clockwise so that the separation roller and the pickup roller rotate to separate the first original.
   The lifter starts to move down, and then the pickup roller starts to move up.
   When the pre-registration sensor (U502) detects the leading edge of the original (ON), the separation motor stops.

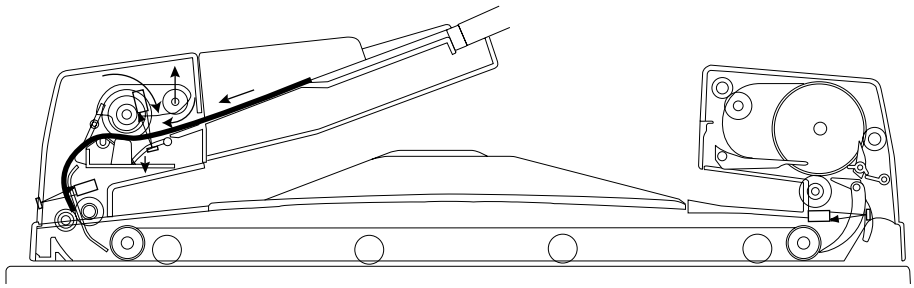

**Figure 2-266**

3. The feed motor (M2) rotates clockwise, and the original is moved to the copyboard glass. When the pre-registration sensor (U502) detects the trailing edge of the original (OFF), the ADF will be in wait for pickup.

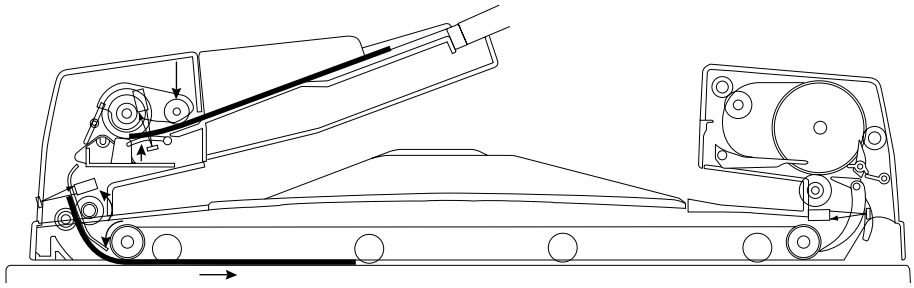

**Figure 2-267**


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4. When the pre-registration sensor (U502) detects the trailing edge of the original (OF), the feed motor (M2) starts to slow down. The feed motor stops when the original reaches the image leading edge position, at which time its face is scanned.

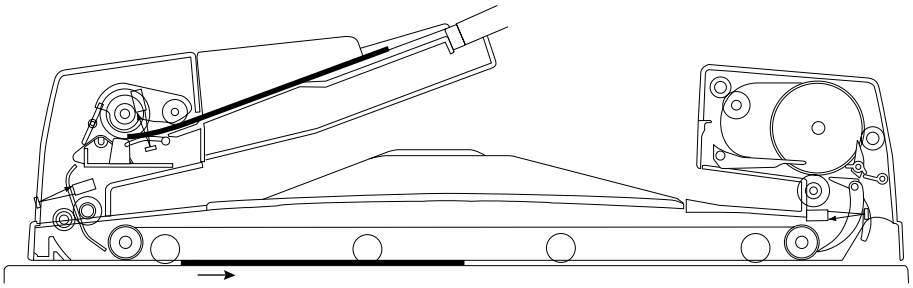

**Figure 2-268**

5. When scanning ends, the feed motor (M2) rotates clockwise, and the original is moved to the reversal delivery assembly.
When the reversal inlet sensor (SR4) detects the leading edge of the original (ON), the reversal delivery motor (M3) starts to rotate.
The reversal delivery flapper remains closed while the reversal delivery motor is rotating clockwise.

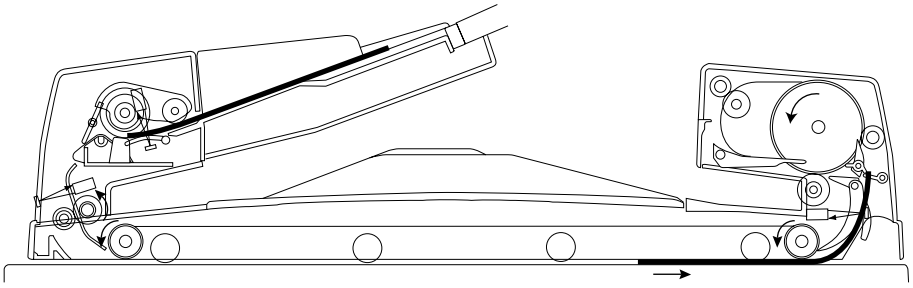

**Figure 2-269**

6. When the reversal outlet sensor (U505) detects the leading edge of the original (ON), the feed motor (M2) stops once, and starts to rotate counterclockwise, causing the original to reach the copyboard glass face down.

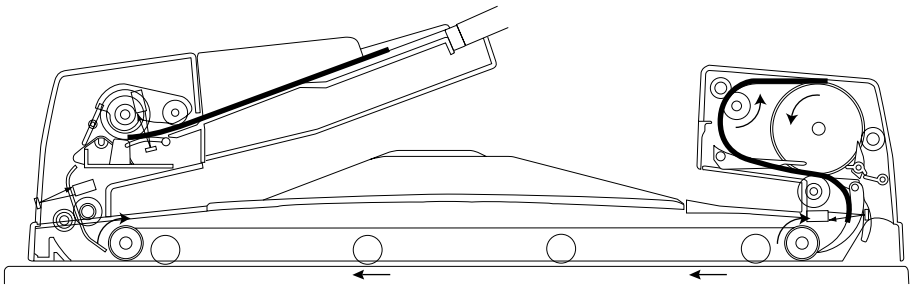

**Figure 2-270**

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7. The original is moved to the copyboard glass and then to the pickup assembly. When the pre-registration sensor (U502) detects the leading edge of the original, the feed motor (M2) stops.

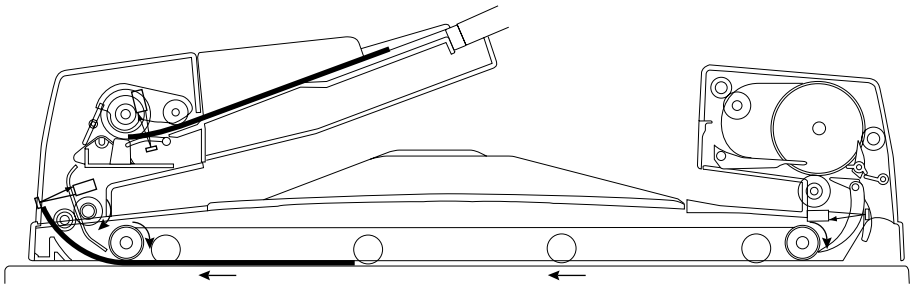

**Figure 2-271**

8. The feed motor stops once, and starts to rotate clockwise. When the pre-registration sensor (U502) detects the leading edge of the original (OFF), the feed motor (M2) starts to slow down. The feed motor stops when the leading edge of the original reaches the image leading edge position.

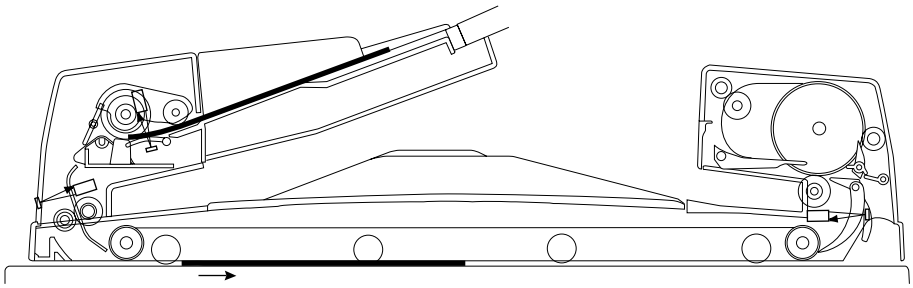

**Figure 2-272**

9. When the original reaches a specific position, the reversal delivery motor (M3) rotates counterclockwise for a limited time so that the reversal delivery flapper opens to switch the paper path. The back of the original is then scanned.

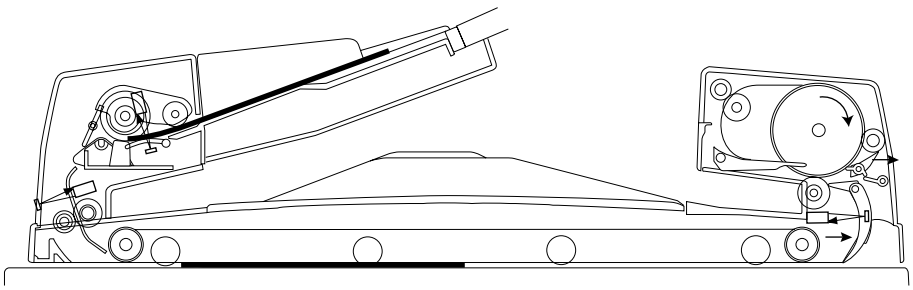

**Figure 2-273**


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10. When scanning ends and separation of the 2nd original starts, the feed motor (M2) starts to rotate clockwise, moving the 1st original to the right side.

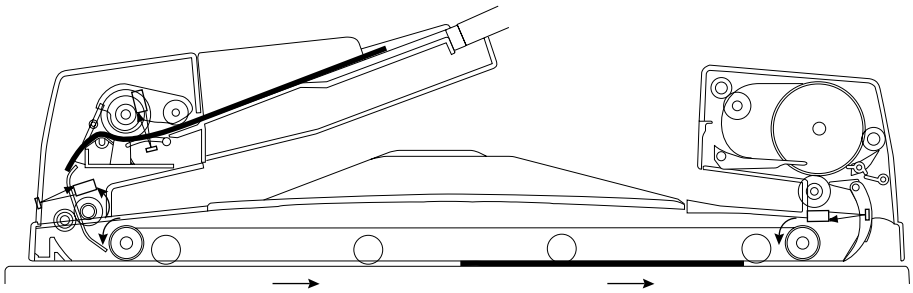

**Figure 2-274**

11. When the feed motor stops, the separation motor (M1) rotates clockwise to separate the original. When the pre-registration sensor (U502) detects the leading edge of the original (ON), the separation motor stops.

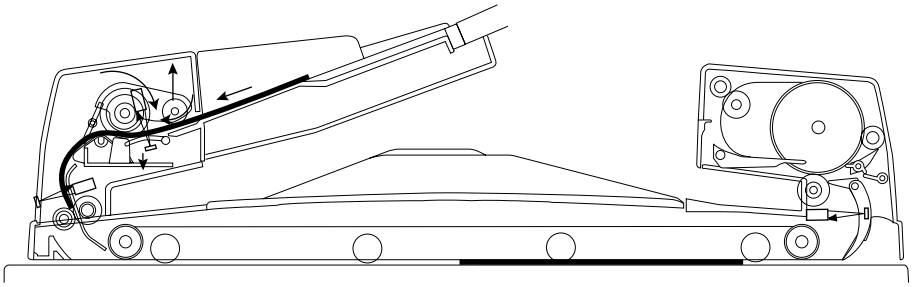

**Figure 2-275**

12. After the separation motor stops, the feed motor (M2) starts to rotate clockwise while the reversal delivery motor (M3) starts to rotate counterclockwise.
The first original is moved to the delivery tray, and the next original is moved to the copyboard glass.

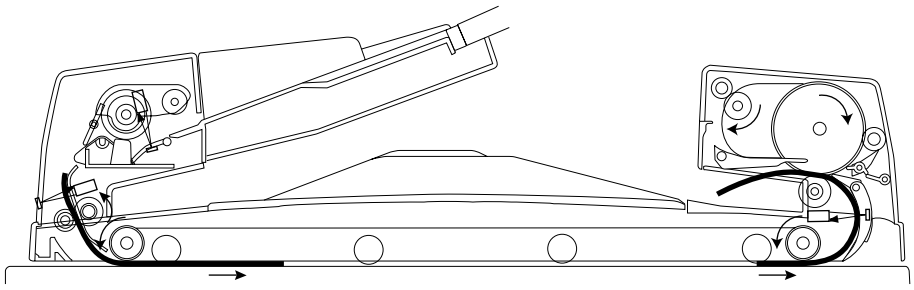

**Figure 2-276**

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13. When the pre-registration sensor (U502) detects the trailing edge of the next original (OFF), the feed motor (M2) slows down and stops as soon as the trailing edge of the original reaches the image leading edge position.
    When the reversal delivery inlet sensor (SR4) detects the leading edge of the first original (ON) and the original is then moved over a specific distance, the reversal delivery motor (M3) slows down and stops as soon as the original reaches the original delivery tray.
    The reversal delivery motor stops once, and rotates clockwise for a limited time so that the reversal delivery flapper closes.

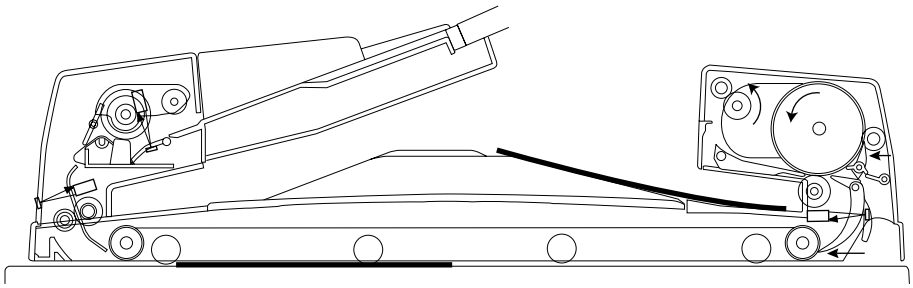

**Figure 2-277**

### 4. Mixed Sizes

The ADF allows placement of originals of different sizes (but of the same configuration width). Regardless of whether they are small- or large-size, the second original is sent to the copyboard glass only after the first original has been delivered. The mode of operation is the same as the mode used for large-size paper or the last of double-sided copying.

### 5. Jam Removal Mode

When a jam occurs, the originals that may have been copied and that remain on the copyboard glass are moved without specific operation. The flow of originals is the same as when making single-sided copies, but scanning does not take place.


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## G. Detecting an Original Jam

The ADF uses the following sensors to check for original jams. The timing at which checks are made is stored in advance in the CPU (Q1) on the ADF controller PCB, and a jam is identified in relation to the presence/absence of paper over a specific sensor.

In response to a jam, the ADF communicates to the copier in the form of a code, which may be checked in the copier's service mode (COPIER>DISPLAY>JAM).

**Service Mode Screen (copier)**

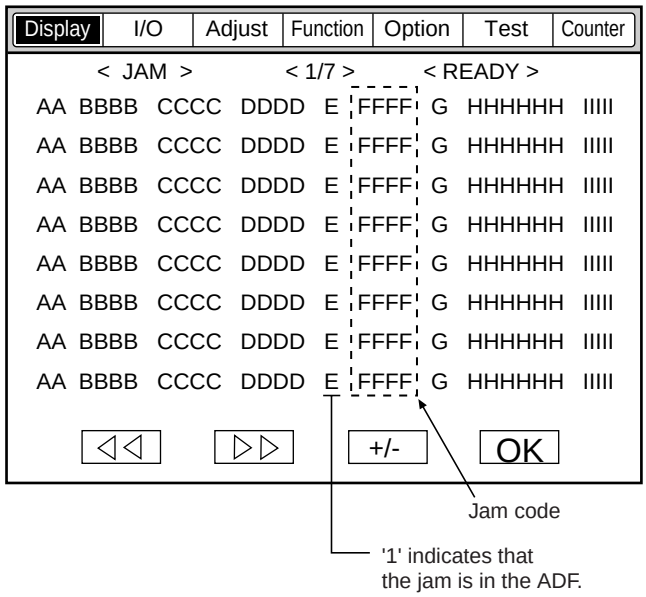
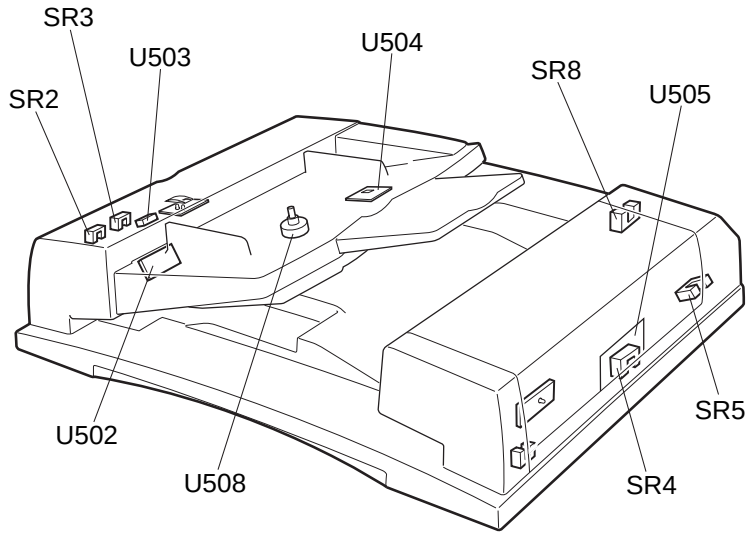



**Figure 2-278**




SR2 ..... pickup unit cover sensor
SR3 ..... separation sensor
SR4 ..... reversal inlet sensor
SR5 ..... reversal registration sensor/ delivery sensor
SR6 ..... ADF open/closed sensor
SR8 ..... reversal delivery unit cover sensor
U502 .... pre-registration sensor
U503 .... original set sensor
U504 .... last original sensor
U505 .... reversal outlet sensor
U508 .... original detecting volume

**Figure 2-279**

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**Note:**

1. Response to a Jam

The ADF is stopped immediately in response to any of the jams in Table 2-207.

2. Resetting after a Jam

For a pickup delay jam, remove the originals from the original tray to reset the ADF. For other types of jams, remove the originals from the original tray and from inside the ADF; then, open and close the ADF to reset.

3. An alarm indication will turn on when either of the following is executed:

· mixed size operation without selecting mixed size mode
· copying stapled originals

If the original must be removed from inside the machine, both jam and alarm indications will be turned on.

For example, the "Alarm and 8C Jam" indications may be turned on at the same time. The alarm indication will remain for 5 sec after removal of the jam and, thereafter, the alarm will automatically turn off.


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The sensors and conditions used to identify jams are as follows:

| Jam | Code | Sensor | Condition |
|---|---|---|---|
| Separation delay | 0002 | SR3 | The separation sensor (SR3) does not turn on within 50 msec after the separation motor (M1) has started to rotate. |
| Pickup delay | 0003 | U502 | The pre-registration sensor (U502) does not turn on within 1 sec after the original has left the separation sensor (SR3) in the case of a small-size original or a point near the separation sensor in the case of a large-size original. |
| Pickup stationary | 0005 | U502 | The pre-registration sensor (U502) does not turn off when the feed motor has rotated for 500 msec after the original was made to arch at the registration roller. |
| Separation timing | 0006 | SR3 | The separation sensor (SR3) is on when separation of the original starts. |
| Reversal outlet delay | 0011 | U505 | The reversal outlet sensor (U505) does not turn on a specific time after the trailing edge of the original has moved past the right edge of the belt registration roller. |
| Reversal outlet stationary | 0012 | U505 | The reversal outlet sensor (U505) does not turn on when the delivery motor has rotated for 500 msec after the reversal registration sensor (SR5) detected the trailing edge of the original. |
| Duplexing pre-registration sensor delay | 0023 | U502 | The pre-registration sensor (U502) does not turn on a specific time after the double-sided original has been moved to the pick-up unit side from the copyboard glass after it was turned over. |
| Delivery inlet delay | 0041 | SR4 | The reversal inlet sensor (SR4) does not turn on when the feed motor (M2) has been rotated for an equivalent of 10 mm after the original is picked up in the case of a small-size original or from a point 51 mm of the reversal inlet sensor (SR4) in the case of a large-size/double-sided original. |
| Delivery stationary | 0042 | SR4 | The reversal inlet sensor (SR5) does not turn off a specific time after the leading edge of the original has reached the reversal registration roller nip in the case of a small-size original or after the leading edge of the original has reached the reversal outlet sensor (U505) in the case of a large-size/double-sided original. |
| Reversal registration delay | 0043 | SR5 | The reversal registrations sensor (SR5) does not turn on a specific time after the reversal inlet sensor (SR4) has turned don. |
| Reversal registration stationary | 0044 | SR5 | The reversal registration sensor (SR5) doe not turn off a specific time after the reversal inlet sensor (SR4) has turned off. |
| Reversal flapper fault | 0045 | U505 | The flapper is not switched when the reversal outlet sensor (U505) checks the switch-over at each delivery. |
| Delivery sensor delay (small-size) | 0046 | SR5 | The delivery sensor (SR5) does not turn off within a specific time after the reversal delivery motor (M3) has started to rotate counterclockwise. |
| Delivery sensor stationary (small-size) | 0047 | SR5 | The delivery sensor (SR5) does not turn off when the trailing edge of the original has been fed 50 mm after it has moved past the delivery sensor (SR5). |
| Delivery sensor delay (large-size, double-sided) | 0048 | SR4 | The reversal inlet sensor (SR5) doe not turn on a specific period after delivery has started. |

**Table 2-207-1**

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| Jam | Code | Sensor | Condition |
|---|---|---|---|
| Reversal delivery unit cover open | 0080 | SR8 | The reversal delivery unit cover is open when the copier is at rest in the absence of copy paper. |
| ADF open | 0081 | SR6 | The ADF is opened while the copier is at rest in the absence of copy paper. |
| Pickup cover open | 0082 | SR2 | The pickup unit cover is opened while the copier is at rest in the absence of copy paper. |
| Residual original | 0088 | SR4,SR5 | An attempt at pickup is made with an original on the copyboard glass. The reversal inlet sensor (SR4) and the reversal registration sensor (SR5) are used. |
| Timing fault 1 | 008A | | When making a double-sided copy, pickup timing for the second side fails. Or, the end of the task is not detected after a specific time. |
| Timing fault 2 | 008B | | When originals are fed continuously, a second original has been picked up while the delivery clock sensor (SR7) is used to check a delivery original, not enabling detection of the encoder pulses from the reversal delivery motor (M3). |
| Timing fault 3 | 008C | | If originals of different sizes are sent without selecting mixed size mode, the original size error alarm (0014) will be turned on. This jam indication is turned on to draw attention to the need of removing the jam. 008C (jam) and 0014 (alarm) are indicated at the same time, and the machine will reset itself automatically in 5 sec after the removal of the jam. |
| User ADF open | 0091 | SR6 | The ADF is opened while the ADF is in operation. |
| User cover open | 0092 | SR2,SR8 | The cover is opened while ADF is in operation. |
| Separation sensor initial condition | 0094 | SR3 | The separation sensor (SR3) is on before the first original is separated. |
| Pre-registration sensor initial condition | 0095 | U502 | The pre-registration sensor (U502) is on before the first original is separated. |
| Reversal inlet sensor initial condition | 0096 | SR4 | The reversal inlet sensor (SR4) is on before the first original is separated. |
| Reversal registration sensor | 0097 | SR5 | The reversal registration sensor (SR5) is on before the first original is separated. |

**Table 2-207-2**


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## H. Alarm Detection

The machine's alarm code is as follows, and may be checked by making the following selection:
COPIER>DISPLAY>ALARM-1>DF

Alarm Display Screen (copier's service mode)

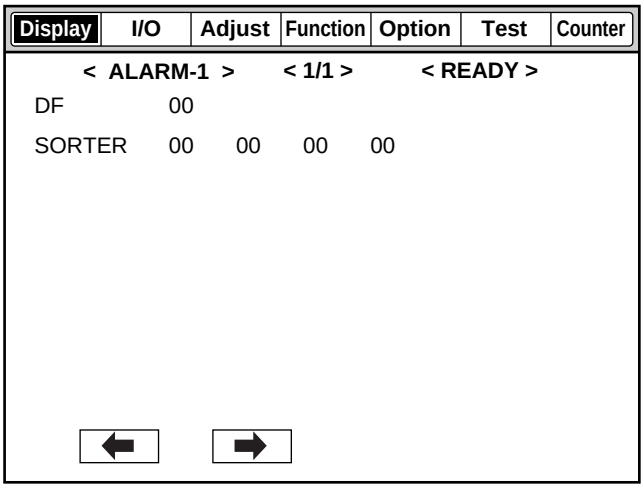


**Figure 2-280-1**

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The sensors and conditions used to identify alarms are as follows:

| Jam | Code | Sensor | Condition |
|---|---|---|---|
| Separation fault | 0003 | SR3 | When picking up the 1st sheet, the separation sensor (SR3) does not turn on 500 msec after the separation motor (M1) has been rotated clockwise. |
| Jam recovery count error | 0011 | | The jam recovery count is higher than the number of originals. |
| Original extraction | 0013 | | The original has been pulled off the tray while originals are processed. |
| Original size error | 0014 | | Originals of different sizes are used without selecting mix size mode. Or, originals different in size by ±10 mm or more in feeding direction have been detected.<br>The selected combination of operating modes cannot be executed.<br>008C (jam) will also be indicated at the same time. |
| Operation mode error | 0021 | | After the removal of the jam, the alarm (0014) will be indicated for 5 sec; thereafter, the alarm will automatically be reset. |

**Figure 2-207-3**


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**Reference:**

At time of a jam, the copier remembers how may originals it has copied, and sends the information to the ADF controller upon removal of the jam.
In response, the ADF controller circulates the originals that have been copied already, and places the originals that have not been copied on the copyboard for copying. For this reason, normal copying operation would not be possible if the number of originals after removal of jams differs from the number of originals before the jam.
In the case of [1] in the following diagram, the ADF and the copier will stop to operate, treating the condition as a "different numbers of originals." Keep in mind, however that, in the case of [2], normal operation will continue.

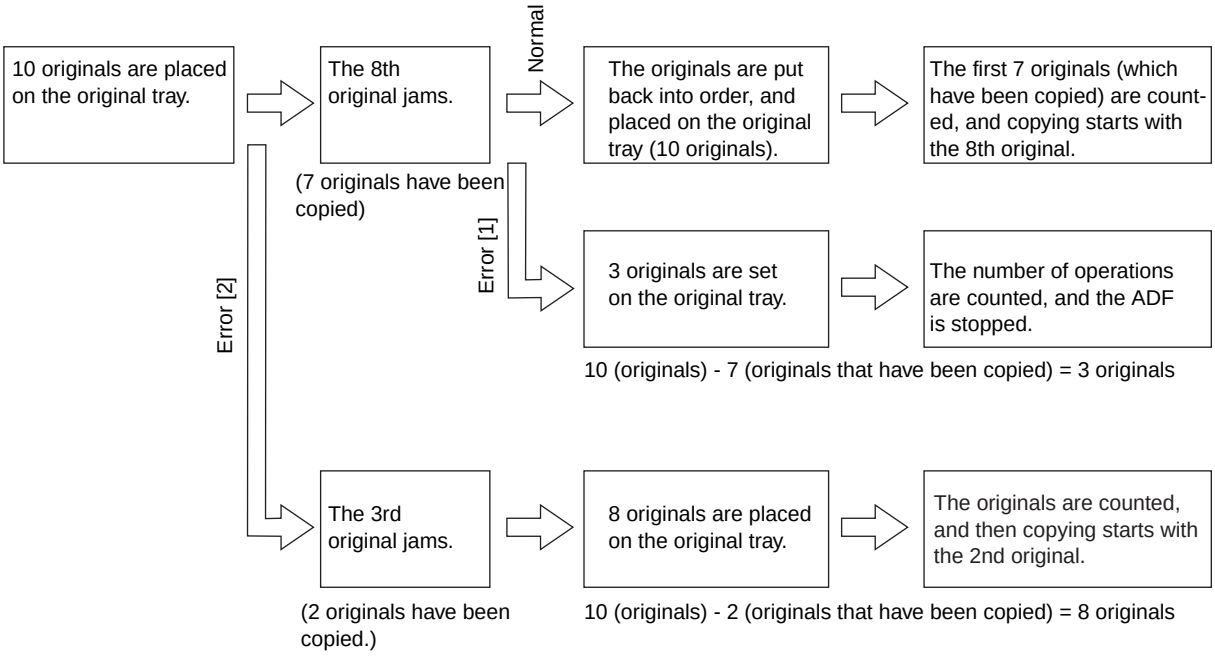
10 originals are placed on the original tray.
The 8th original jams.
Normal
The originals are put back into order, and placed on the original tray (10 originals).
The first 7 originals (which have been copied) are counted, and copying starts with the 8th original.
(7 originals have been copied)
Error [1]
3 originals are set on the original tray.
The number of operations are counted, and the ADF is stopped.
10 (originals) - 7 (originals that have been copied) = 3 originals
Error [2]
The 3rd original jams.
8 originals are placed on the original tray.
The originals are counted, and then copying starts with the 2nd original.
(2 originals have been copied.)
10 (originals) - 2 (originals that have been copied) = 8 originals

**Figure 2-280**

## 1. Resetting

To reset in response to wrong placement of originals, remove all originals from the original tray, and place them back again. The copier will indicate a message; follow the instructions.

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# I. Power Supply

The following figure shows an outline of the power supply system.

The ADF is supplied with two channels of 24 V power by the copier. One line (J2) runs through a circuit breaker (CB1) to reach various loads; the circuit breaker is designed to turn on in response to an overcurrent threatening the ADF's circuitry. The other line (J1F) caries power which is converted into 5 V by a regulator (Q17) and is used by logic and sensor systems; a fuse resistor (FU1, FU2) is provided to cut off the power in response to an overcurrent in the circuit, thereby protecting the circuit.

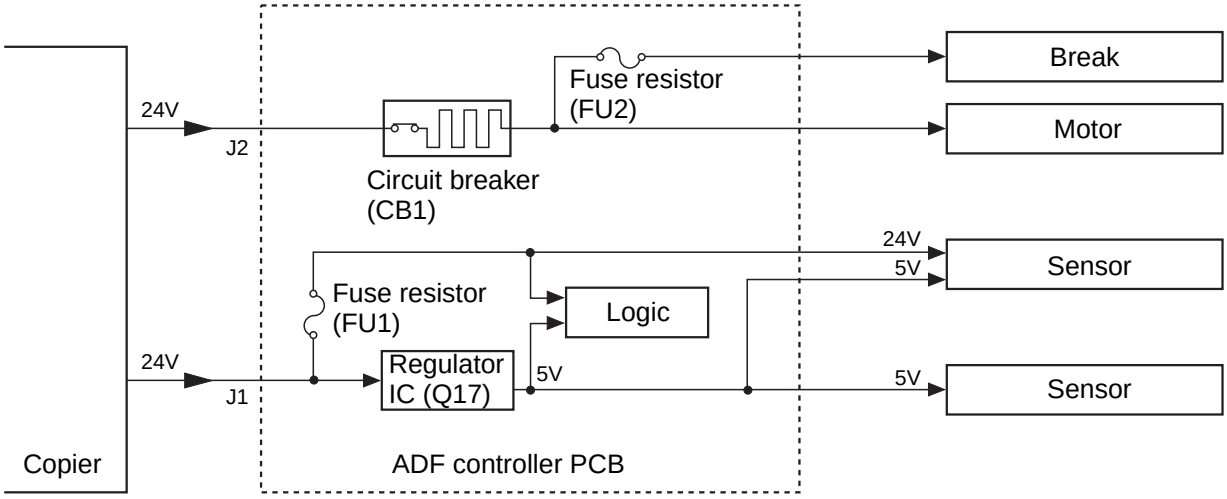


**Figure 2-281**


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# CHAPTER 3

# MECHANICAL SYSTEM


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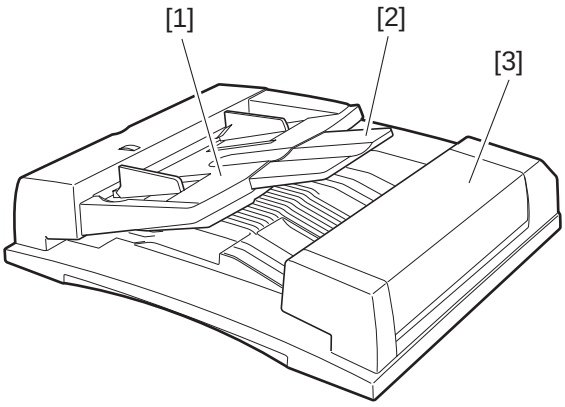
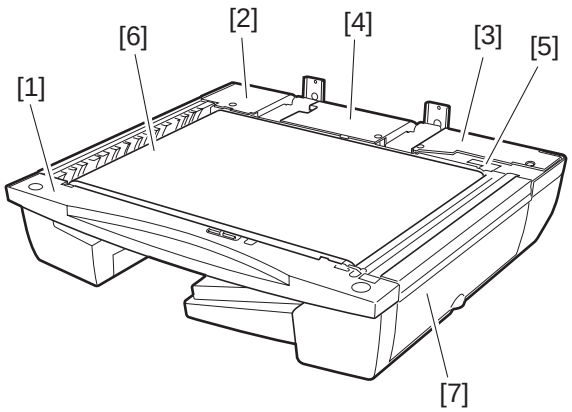
# I. BASIC CONSTRUCTION

## A. External Covers




[1] Original tray
[2] Auxiliary tray
[3] Reversal delivery unit cover

**Figure 3-101**




[1] Front cover
[2] Rear cover 1
[3] Rear cover 2
[4] ADF controller cover
[5] Timing belt cover
[6] Feed belt
[7] Pickup unit cover

**Figure 3-102**

Remove the appropriate covers as follows when cleaning, inspecting, or repairing the inside of the machine.

### 1. Removing the Original Tray

1) Mark the position of the original tray in advance (by referring to the graduations under the fixing screw).

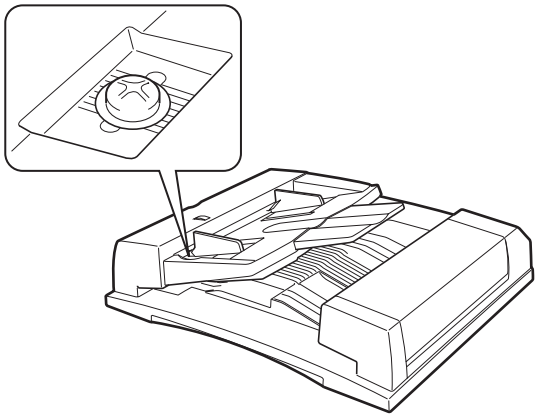


**Figure 3-103**

2) Remove the two fixing screws [1], and shift the original tray [2] to the front.
3) Remove the screw [4], and disconnect the connector [5]; then, detach the grounding wire [3].
4) Detach the original tray.

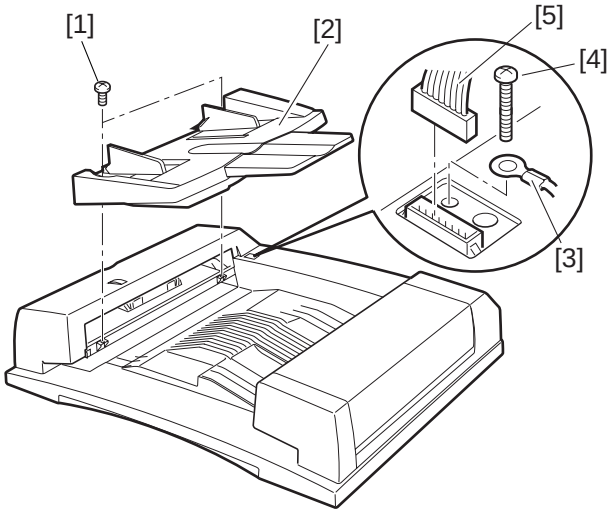



**Figure 3-104**

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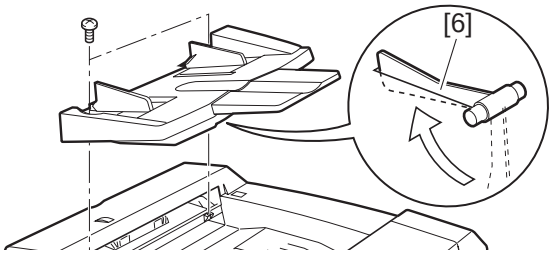


**Figure 3-105**

**Caution:**
When mounting the original tray, try fitting the original retainer [6] into the pickup side.

## 2. Removing the ADF

1) Turn off the copier.
2) Disconnect the communication cable of the ADF from the copier.
3) Open the ADF fully.

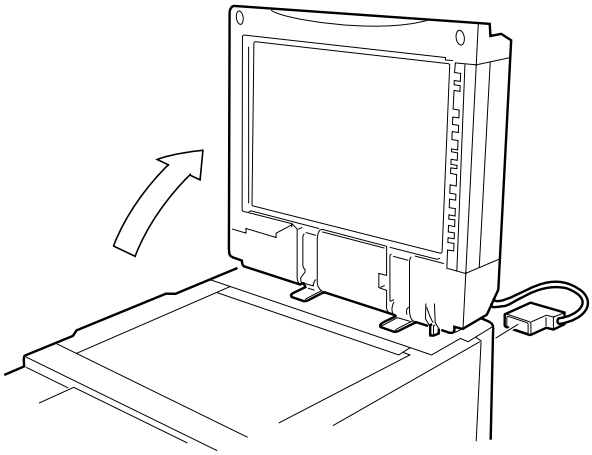

**Figure 3-106**

4) Remove the two screws.

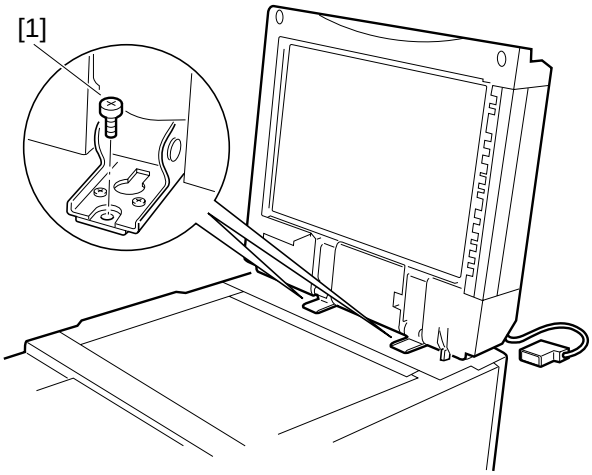


**Figure 3-107**

5) Shift the ADF to the rear, and lift the ADF by holding it with both your hands.

**Caution:**
The foot of the hinge is equipped with a locking mechanism, requiring you to open the ADF fully when detaching it from the copier.


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### 3. Removing the Cover

Be sure to detach the ADF from the copier before removing the pickup unit and the reversal delivery unit.

1) Remove the three mounting screws [2] and the TP screw [3]; then, detach the front cover.

2) Remove the three mounting screws [5], and detach the rear cover 1 [4].

3) Remove the three mounting screws [7], and detach the rear cover 2 [6].

4) Remove the two mounting screws 8, and detach the ADF controller cover [9].

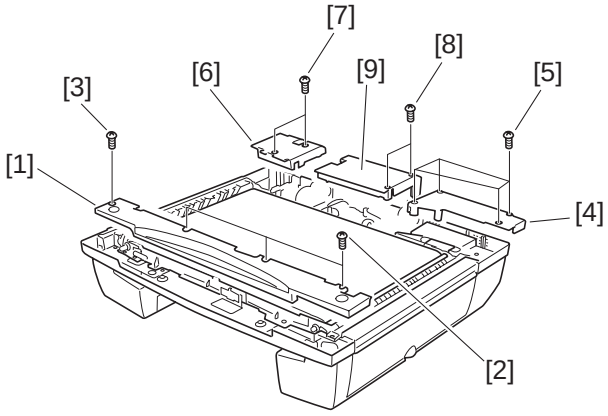


**Figure 3-108**

### ■ When Removing the Feed Belt Unit

1) Remove the three mounting screws [2] and the TP screw [3]; then, detach the front cover [1].

2) Remove the three mounting screws [5], and detach the rear cover 1 [4].

3) Remove the three mounting screws [7], and detach the rear cover 2 [6].

4) Remove the two mounting screws [8], and detach the ADF controller cover [9].

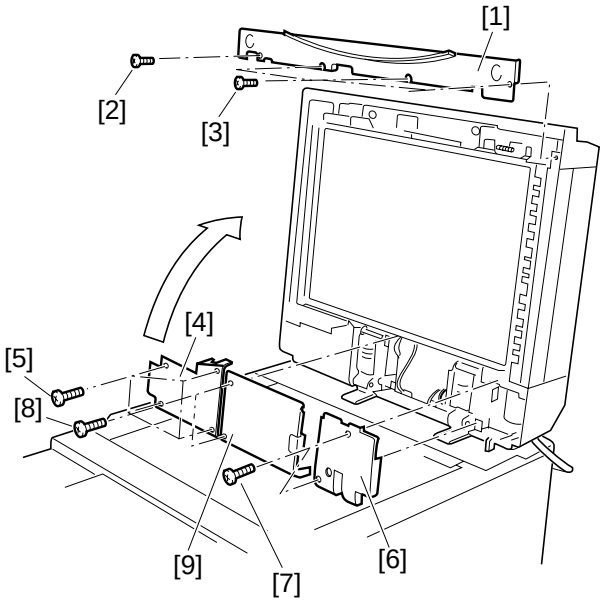


**Figure 3-108-1**

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## B. Removing the Feed Belt Unit

### ■ When Removing the Pickup Unit and the Reversal Delivery Unit

1) Remove the mounting screw [2], and detach the timing belt cover.

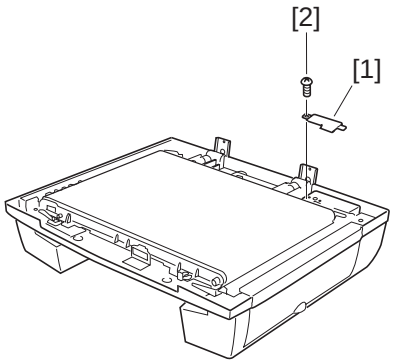


**Figure 3-109**

2) Remove the four stop clips [4], and detach the feed belt unit.

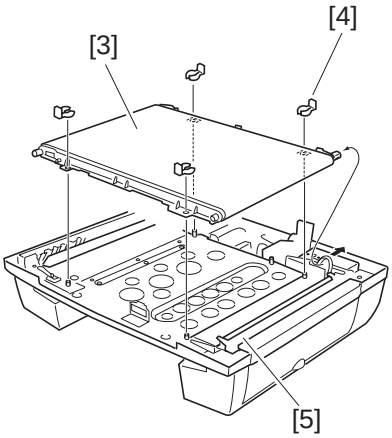


**Figure 3-110**

**Caution:**

When mounting the feed belt unit, try lifting the pickup middle guide [5] slightly.

### ■ When Removing the Feed Belt Unit

1) Remove the mounting screw [2], and detach the timing belt cover.

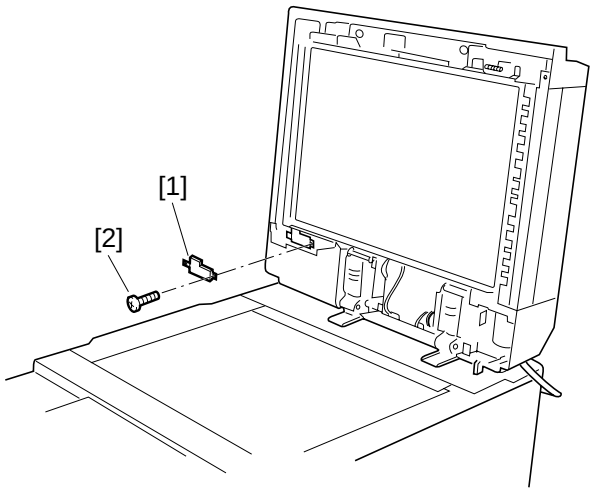


**Figure 3-110-1**

2) Remove the four stop screws [4], and detach the feed belt unit [3].

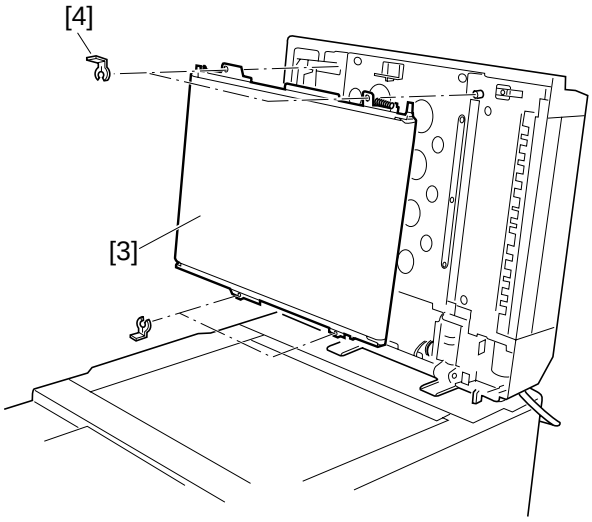


**Figure 3-110-2**


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## C. ADF Controller PCB

### 1. Removing the ADF Controller PCB

**Caution:**

If you must remove the ADF controller PCB as part of removing the pickup unit or the reversal delivery unit, be sure to remove the ADF from the copier first.

1) Remove the two mounting screws [2], and detach the ADF controller cover [1].

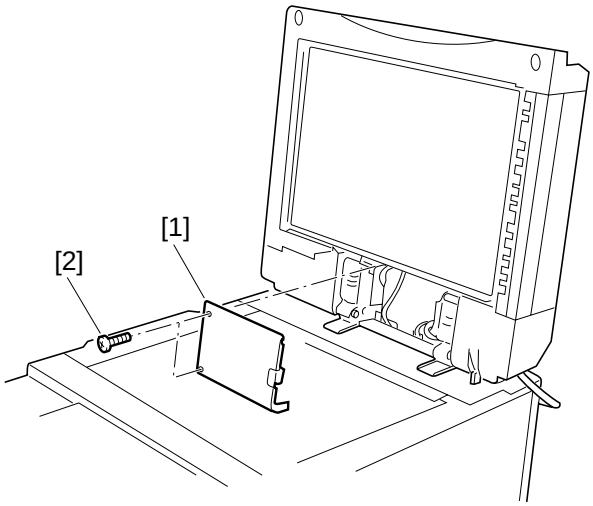


**Figure 3-111**

2) Disconnect all connectors from the ADF controller PCB [3].

3) Remove the two screws [4], and detach the ADF controller PCB [3].

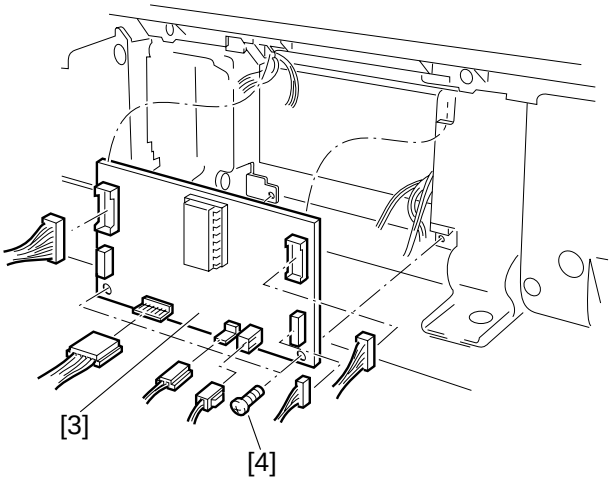


**Figure 3-112**

**Caution:**

Do not touch the connectors of the ADF controller PCB unless necessary.

### 2. Mounting the ADF Controller PCB

When mounting the ADF controller cover, take care so that the harness shown in the figure will not be trapped by the cover.

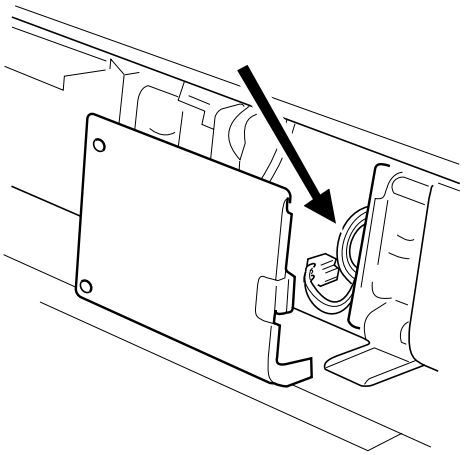

**Figure 3-113**

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# II. DRIVE SYSTEM

## A. Removing the Pickup Unit

Be sure to remove the ADF from the copier before removing any parts of the drive system.

1) Remove the original tray. (See A. "External Covers" under I. "Basic Construction.")
2) Remove the body covers. (See A. "External Covers" under I. "Basic Construction.")
3) Remove the feed belt unit. (See B. "Removing the Feed Roller Unit" under I. "Basic Construction.")
4) Remove the ADF controller PCB. (See C. "Removing the ADF Controller PCB" under I. "Basic Construction.")
5) Remove the seven mounting screws [2], and detach the pickup unit [1].
   To do so, lift the pickup unit cover side at an angle, and put your hand underneath to pull out the cable from the groove while detaching it.

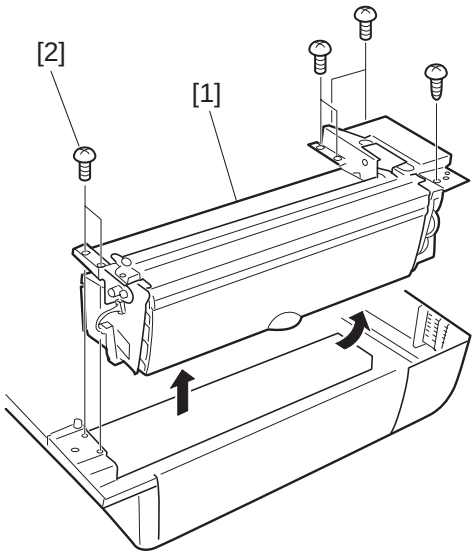


**Figure 3-201**

## B. Removing the Separation Motor(M1)

1) Remove the three mounting screws [2].
2) Disconnect the connector connected to the harness guide [1].
3) Shift the harness guide [1] upward.

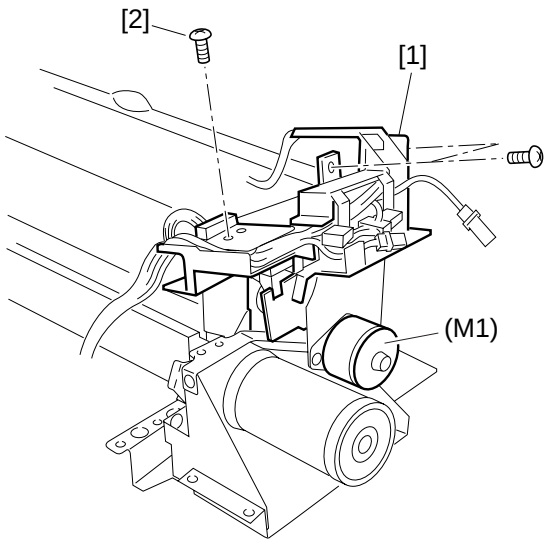


**Figure 3-202**

4) Detach the timing belt from the separation motor [3].
5) Remove the two screws [4], and detach the separation motor [3].

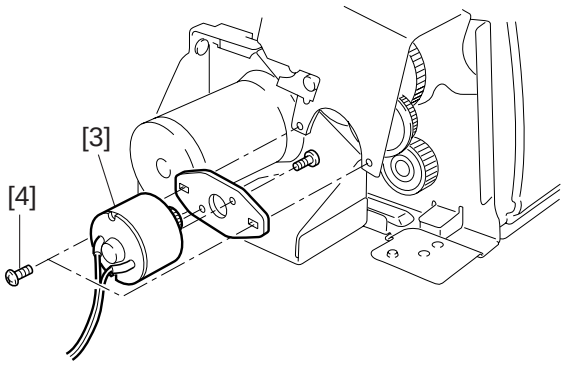


**Figure 3-203**


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## C. Removing the Feed Motor (M2)

1) Remove the harness guide. (See Figure 3-202.)
2) Remove the three mounting screws [2], and detach the motor unit [1] of the pickup assembly.

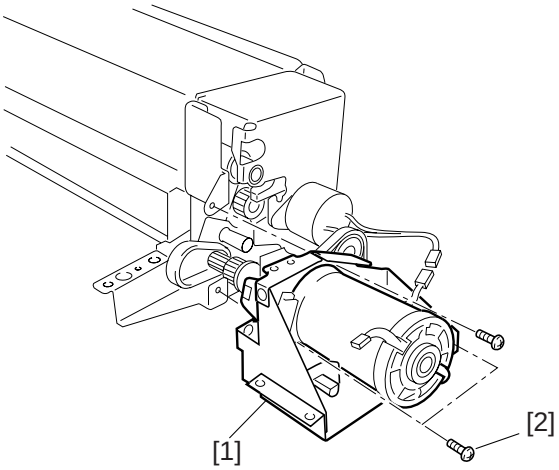


**Figure 3-204**

3) Remove the mounting screw [4], and detach the feed motor clock sensor [3].

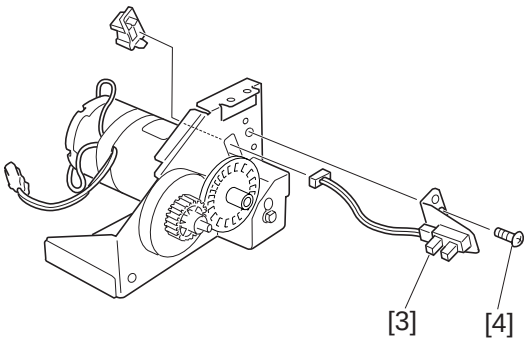


**Figure 3-205**

4) Remove the encoder plate [5] of the feed motor while opening the claw used to keep it in place.

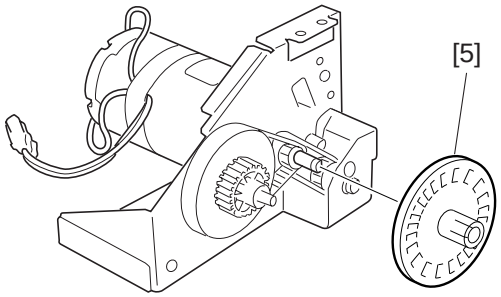


**Figure 3-206**

5) Detach the timing belt [9] of the feed motor, and detach the relay gear [6].
6) Remove the four mounting screws [8], and detach the feed motor [7].

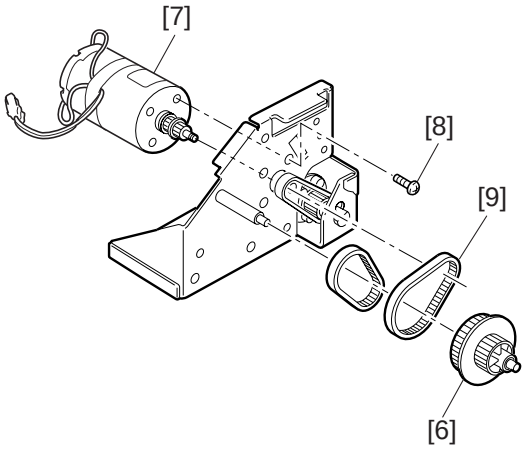


**Figure 3-207**

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**Caution:**

The feed motor has its own orientation. When mounting it, check to make sure that it is oriented with the harness as shown.

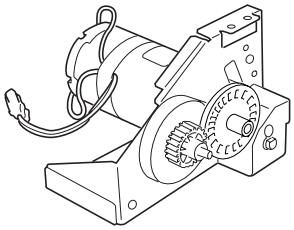

**Figure 3-207-1**

## D. Reversal Delivery Unit

### 1. Removing the Reversal Delivery Unit

1) Remove the screw [2] used to keep the support shaft of the delivery cover [1] in place, and push the support shaft to detach the delivery cover while pulling it to the front.

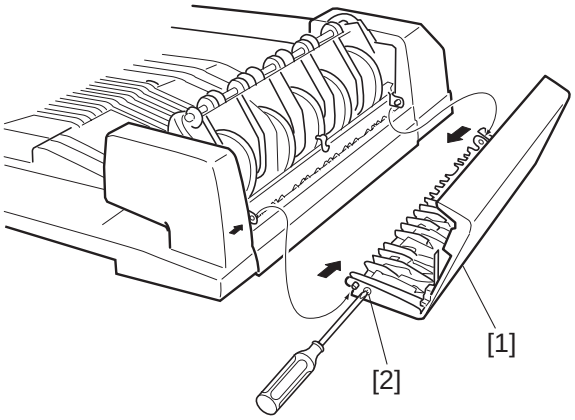


**Figure 3-208**

2) Remove the ADF controller PCB.
3) Fit the connector on the reversal delivery unit side into the groove.
4) Remove the five mounting screws [4], and detach the reversal delivery unit [3].

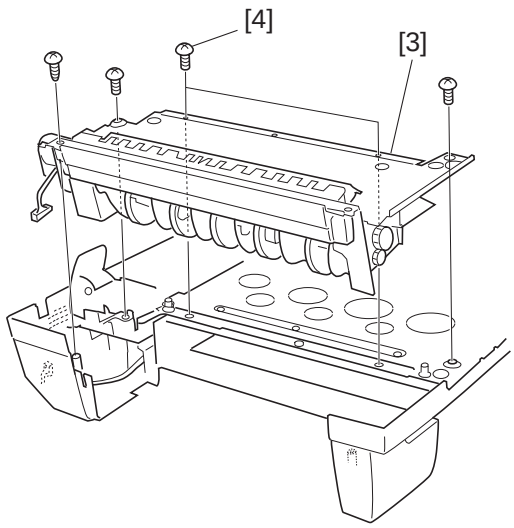


**Figure 3-209**


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### 2. Mounting the Reversal Delivery Unit

When mounting the reversal delivery unit to the feeder, take care so that the unit will not interfere with the plastic film shown in the figure.

If deformed, the plastic film [1] can cause jams in the reversal delivery assembly.

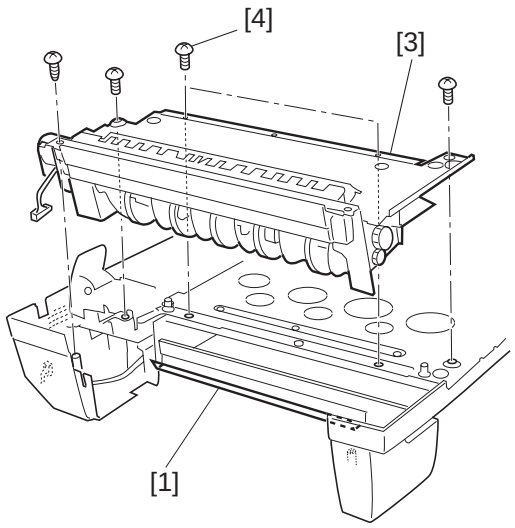


**Figure 3-209-1**

## E. Removing the Reversal Delivery Motor (M3)

1) Remove the reversal delivery unit.
2) Remove the two mounting screws of the harness guide [1].
3) Disconnect the connectors connected to the reversal delivery motor and the reversal delivery motor clock sensor.
4) Remove the two mounting screws [4], and detach the reversal delivery motor [3].

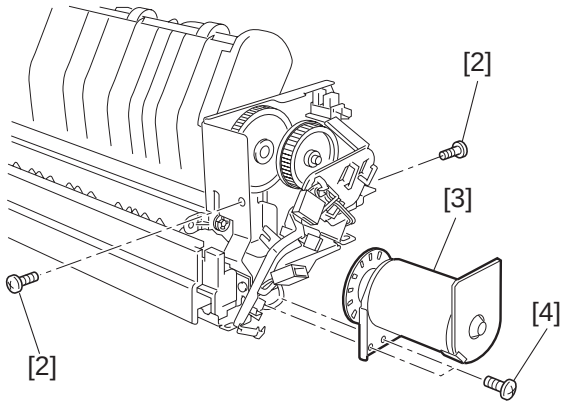


**Figure 3-210**

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# III. FEEDING SYSTEM

## A. Removing the Separation Pad Assembly

1) Set bits 3, 5, and 6 of the DIP switch on the ADF controller PCB to ON (lifter ascent mode).

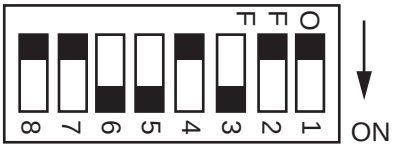


**Figure 3-301**

2) Press the push switch. (In about 3 sec, the lifter will move up and stop automatically.)
3) Close the feeder.
4) Remove the two mounting screws [2], and detach the separation roller cover [1].

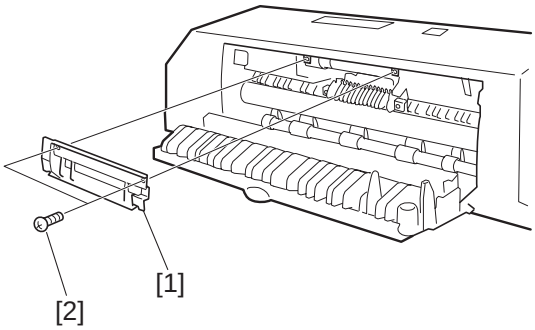


**Figure 3-301-1**

5) Check to make sure that the separation roller holder is as shown.

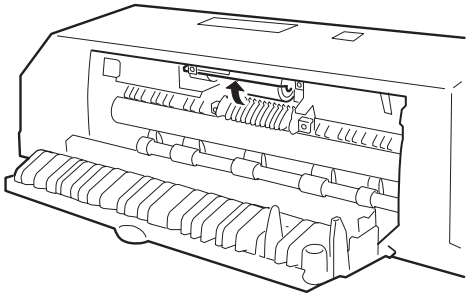

**Figure 3-301-2**

6) Release the guide roll [3] in upward direction with a flat-blade screwdriver or tweezers, and remove it.

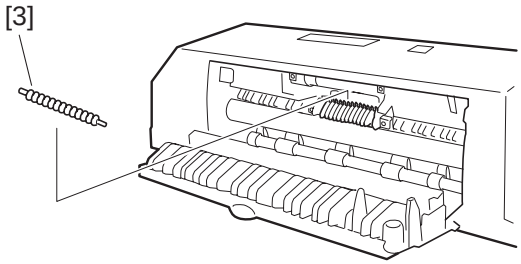


**Figure 3-302**

7) Remove the two screws [5], and detach the separation pad assembly [4].

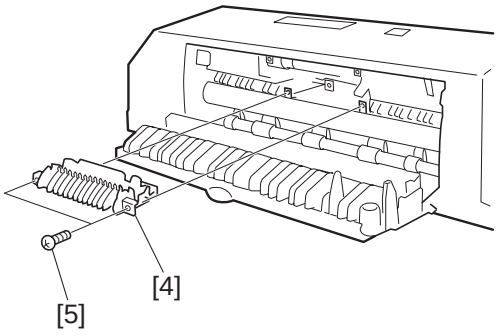


**Figure 3-302-1**


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8) Remove the separation pad [6].

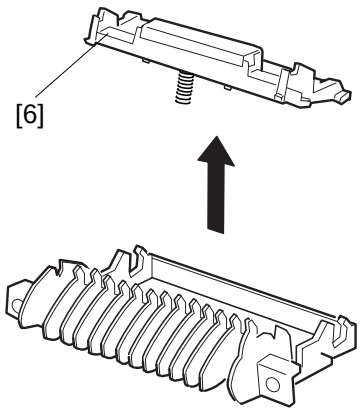


**Figure 3-302-2**

9) After mounting the separation pad, be sure to shift bits 3 and 6 of the DIP switch to ON, and press the push switch (lifter descent mode; in about 3 sec, the lifter will move down and stop automatically).

## B. Removing the Separation Roller

1) Remove the separation pad assembly.

2) Move down the separation roller holder [1], and pull off the stopper [2] as shown.

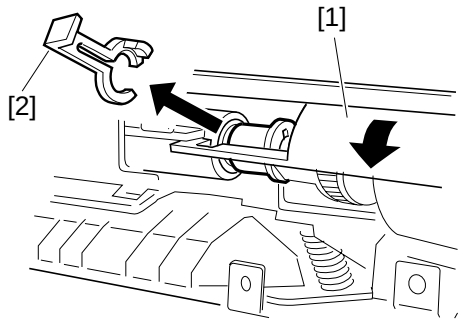


**Figure 3-303**

3) Move the separation roller coupling [3] and the separation bushing [4] to the left with tweezers.

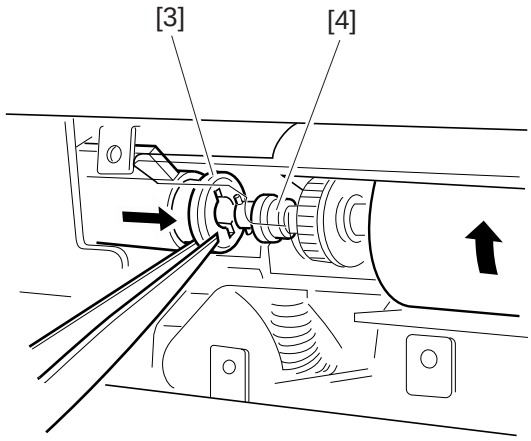


**Figure 3-303-1**

4) Move down the separation roller holder in the direction of the arrow [A], and pull the separation roller unit to the front.

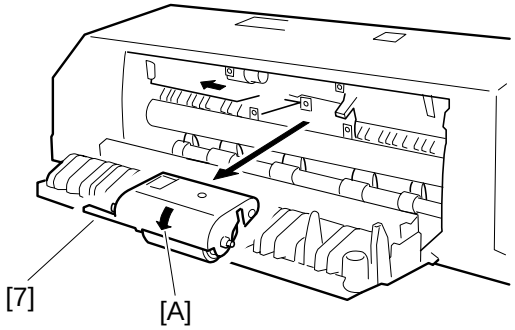


**Figure 3-304**

5) Remove the E-ring [5] used to keep the shaft in place, and pull off the shaft pin [6]. Then, pull off the shaft [7], and detach the separation roller [8].

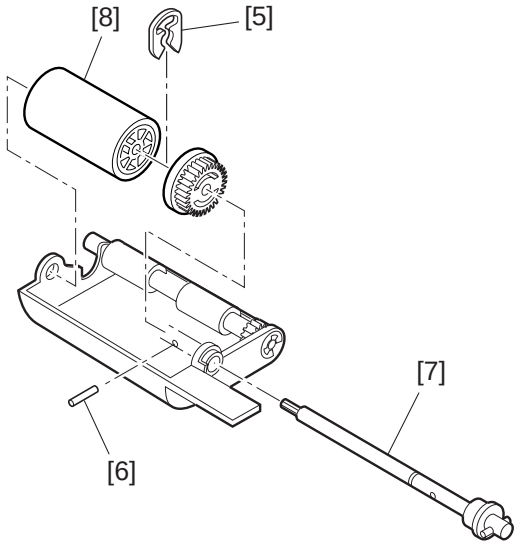


**Figure 3-305**

## C. Removing the Pickup Roller

1) Remove the separation unit. (See A. "Removing the Pickup Roller.")
2) Remove the E-ring [1] used to keep the shaft in place.
   Then, pull off the shaft [2], and detach the pickup roller [3].

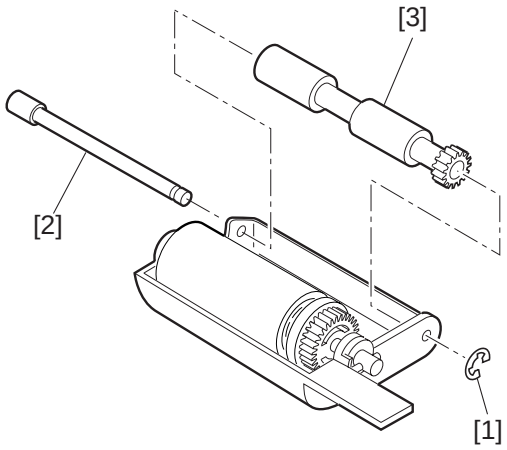


**Figure 3-306**


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## D. Mounting the Separation Roller Unit

1) While paying attention to the position of the bushing, fit the separation roller unit into the pickup unit.

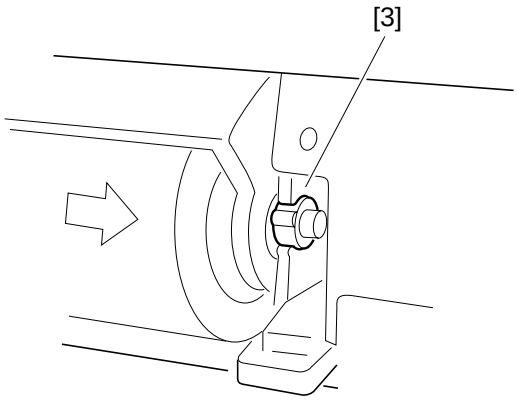


**Figure 3-307**

2) Check to make sure that the separation roller holder lever is under the joint shown in the figure.

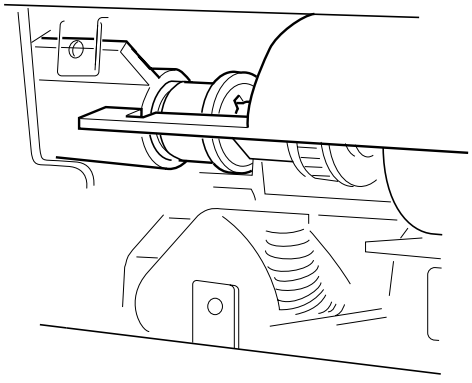

**Figure 3-307-1**

3) Move the bushing [2] to the right.

4) Pick the tip of the coupling [3] with tweezers, slide it to the right, and engage it with the separation roller shaft.
5) While holding the tip of the coupling to the right with tweezers, rotate the separation roller [4] in the direction shown in the figure to engage the spring pin and the coupling.

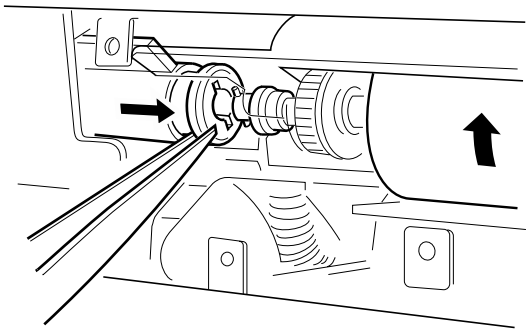

**Figure 3-308**

6) Move the separation roller holder [5] in the direction of [A] in the figure.
7) Fit in the stopper [7].

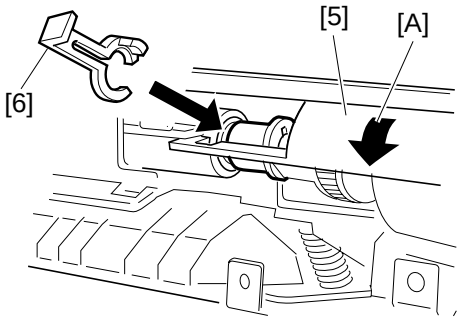


**Figure 3-309**

**Caution:**

Be sure to mount the stopper from above the separation roller holder lever.

8) Move the stopper up and down slightly to make sure that the stopper is in the groove of the separation roller coupling.

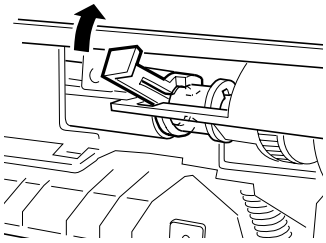

**Figure 3-309-1**

9) After mounting the separation pad or the separation roller, be sure to shift bits 3 and 6 of the DIP switch to ON, and press the push switch (lifter descent mode; in about 3 sec, the lifter will move down and stop automatically).

## E. Removing the Reversing Roller and Feed Roller

1) Remove the reversal delivery unit. (See E. "Removing the Reversal Delivery Unit" under II. "Drive System.")
2) Remove the reversal delivery motor. (See E. "Removing the Reversal Delivery Motor" under II. "Drive System.")
3) Remove the E-rings [1] and [2] used to keep the two gears in place; then, remove the E-ring [3] used to keep the main shaft in place.
   Pull off the shaft pin [4] from the main shaft, and detach the two gears [5] and [6].

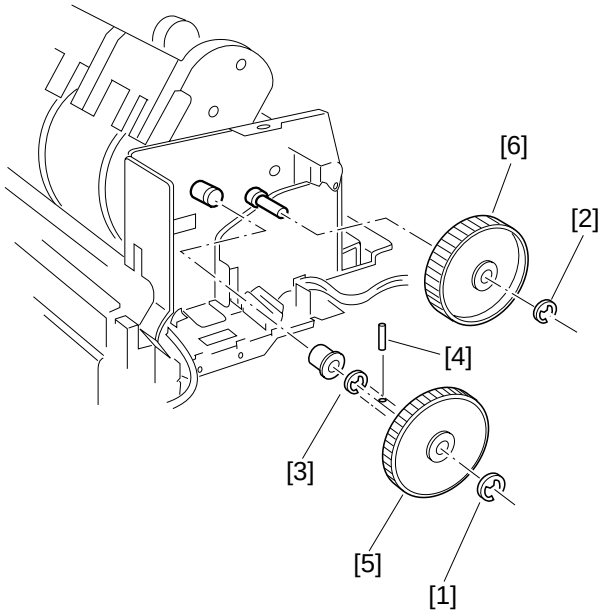


**Figure 3-310**


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4) Remove the grip ring [7] used to keep the gear in place. Remove the gear [9], and remove the E-ring [8] used to keep the shaft in place.

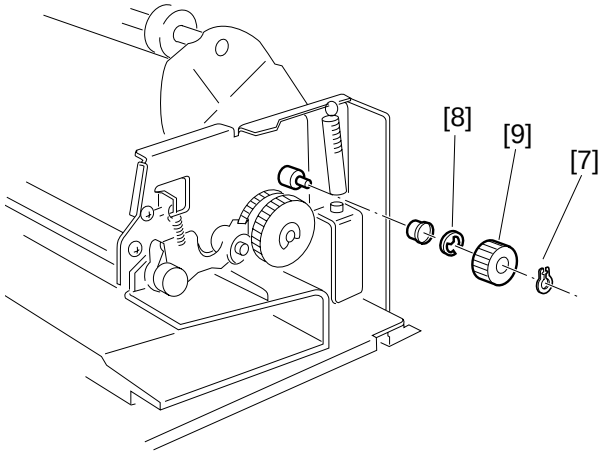


**Figure 3-311**

5) Remove the spring [10] of the middle guide.
6) While lifting the middle guide unit [11], shift the reversing roller [12] together with its shaft in the direction of the arrow to detach.

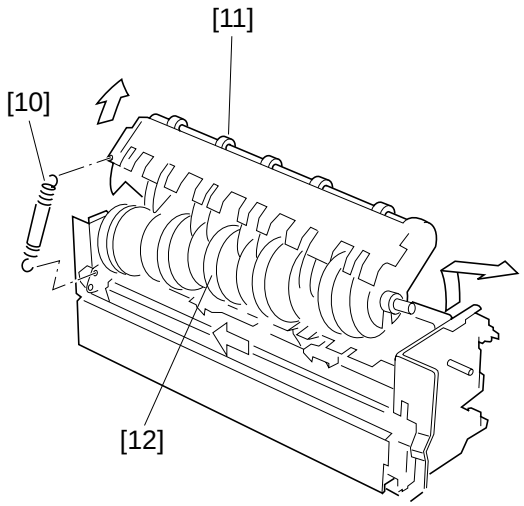


**Figure 3-312**

7) Remove the three mounting screws [14], and detach the gear cover [13].

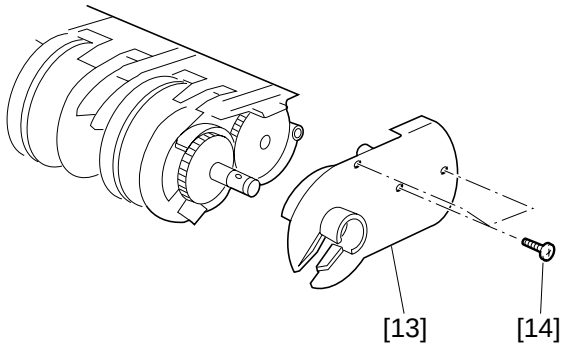


**Figure 3-313**

8) Pull off the shaft pin from the shaft of the reversing roller, and detach the reversing roller [16].

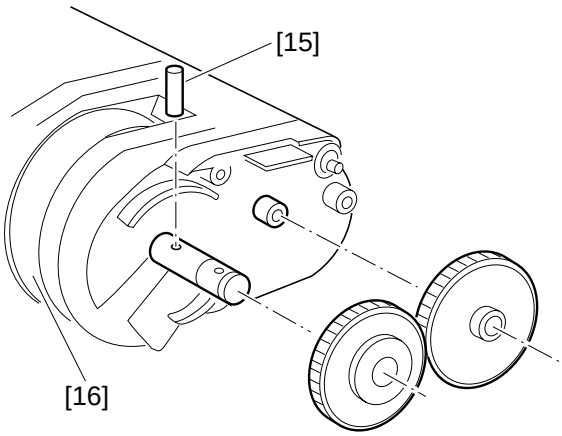


**Figure 3-314**

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9) Remove the E-rings [17] and [18] used to keep the shaft of the feeding roller in place.
10) Remove the bushings [19] and [20] from both ends, and detach the feeding roller [21].

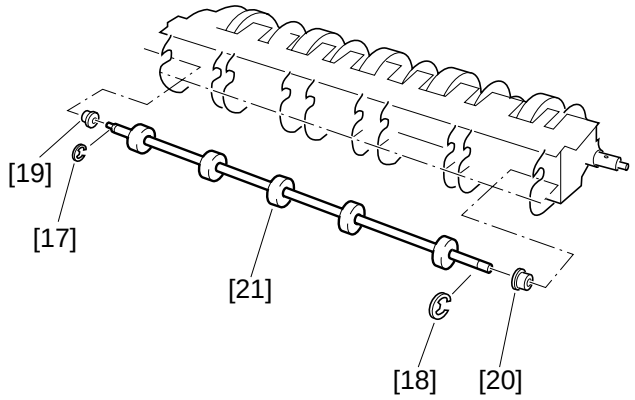


**Figure 3-315**

## F. Replacing the Feed Belt

1) Remove the feed belt unit. (See B. "Removing the Feed Belt Unit" under I. "Basic Construction.")
2) Remove the two springs [1] from both ends of the feed belt unit.

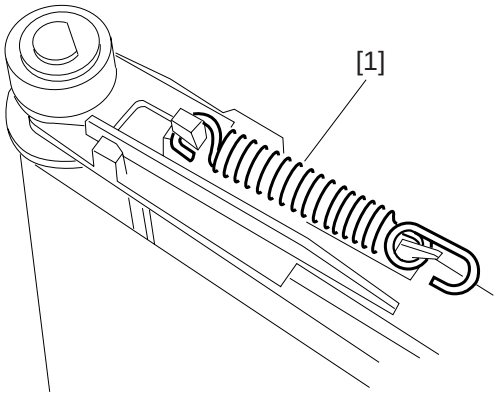


**Figure 3-316**

3) Pull out the feed belt [2].

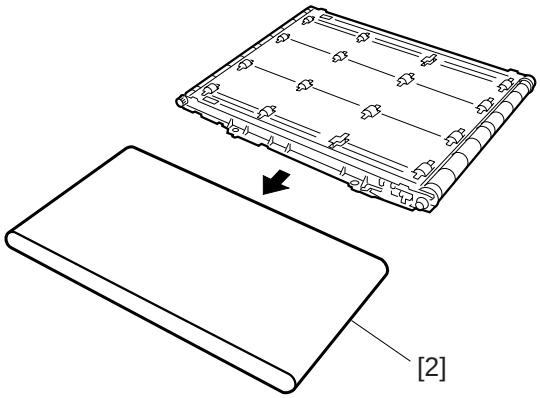


**Figure 3-317**


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**Caution:**

The retaining rolls of the feed belt unit exert different degrees of spring pressure, with the one with a gold-colored spring exerting greater pressure than the one with a silver-colored spring.
Check to make sure that the correct roll is used for each location; there are three types of springs:
[3] : gold-colored spring (2 pc.)
[4] : silver-colored spring (4 cp.)
[3] : other than [4]; silver-colored spring (8 pc.)

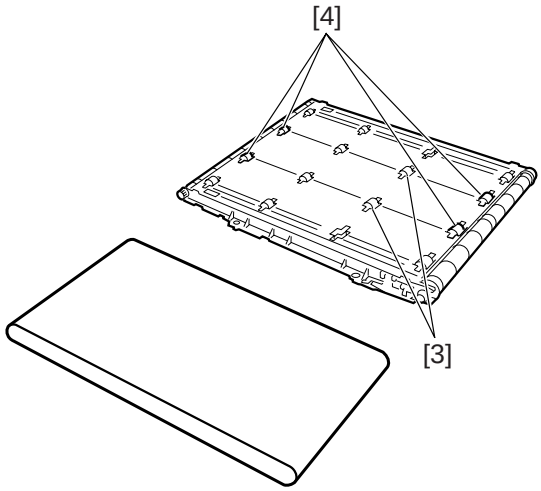


**Figure 3-318**

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# VI. SENSORS

## A. Removing the Original Set Sensor PCB (U503)

1) Remove the pickup unit. (See A. “Removing the Pickup Unit.” under II. “Drive System.”)
2) Shift the harness guide. (See Figure 3-302.)
3) Remove the mounting screw [2], and detach the mounting stay [1] of the original set sensor PCB.
4) Disconnect the connector [5].
5) Remove the two mounting screws [4], and detach the original set sensor PCB [3].

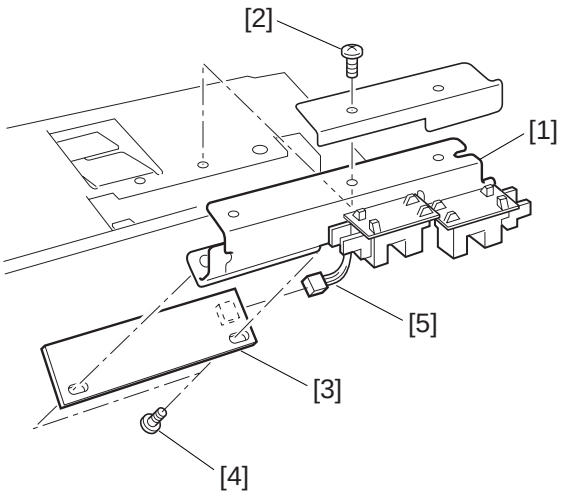


**Figure 3-401**

## B. Removing the Original Set Indicator LED PCB

1) Remove the pickup unit. (See A. “Removing the Pickup Unit” under II. “Drive System.”)
2) Disconnect the connector [3].
3) Remove the mounting screw [2], and detach the original set indicator LED PCB [1].

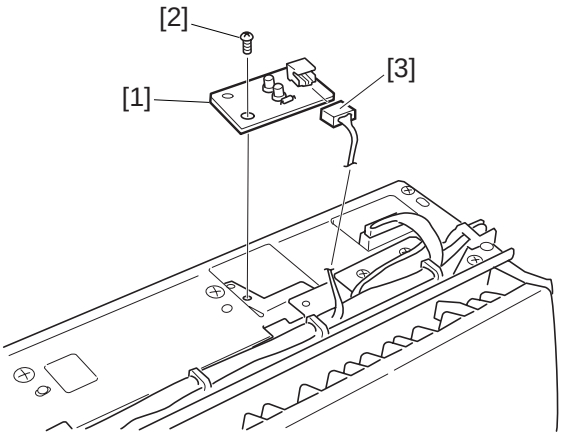


**Figure 3-402**


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## C. Removing the Last Original Sensor PCB (U504)

1) Remove the original tray. (See 1. "Removing the Original Tray" under I. "Basic Construction.")
2) Remove the two mounting screws [2], and detach the original tray cover [1].

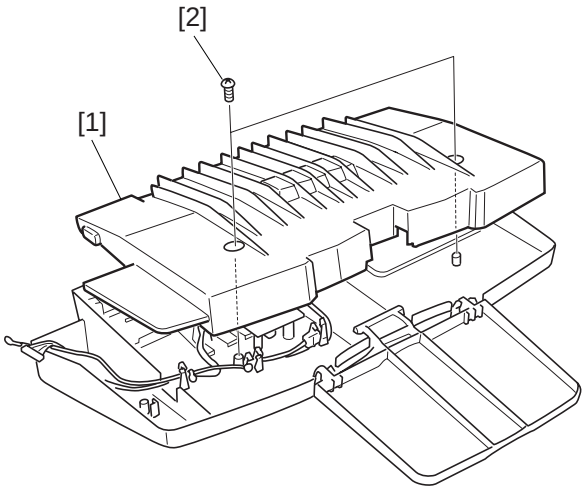


**Figure 3-403**

3) Disconnect the connector [5].
4) Remove the two mounting screws [4], and detach the last original sensor PCB [3].

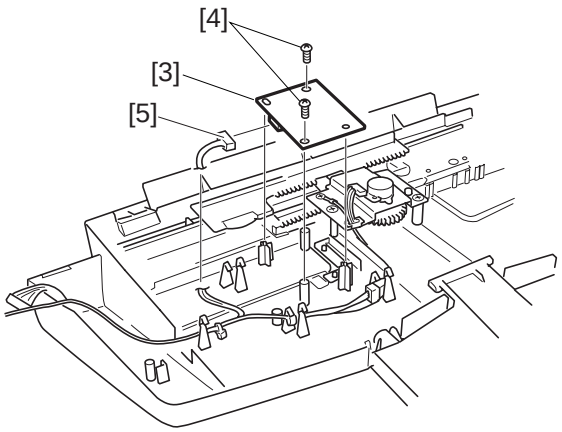


**figure 3-404**

## D. Original Width Detecting Volume (VR)

### 1. Removing the Original Width Detecting Volume

1) Remove the original tray. (See 1. "Removing the Original Tray" under I. "Basic Construction.")
2) Remove the cover of the original tray. (See C. "Removing the Last Original Sensor PCB (U504)."
3) Disconnect the connector [3].
4) Remove the screw [5], and remove the grounding wire [4].
5) Remove the two mounting screws [2], and detach the original width detecting volume PCB [1].

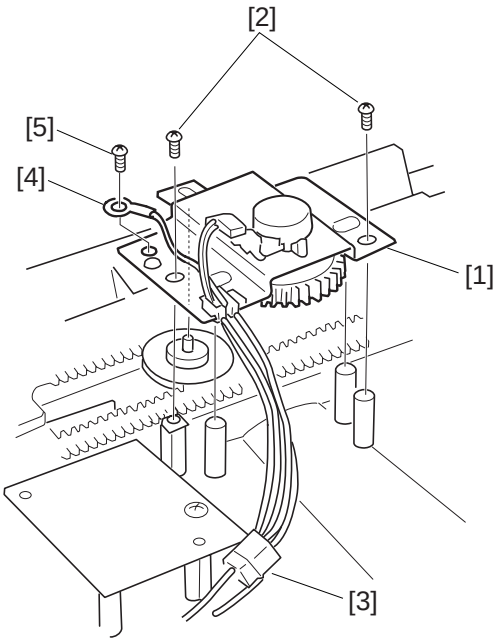


**Figure 3-405**

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## 2. Mounting the Original Width Detecting Volume

1) Remove the width guide roll.
2) Move the side guides to both ends.

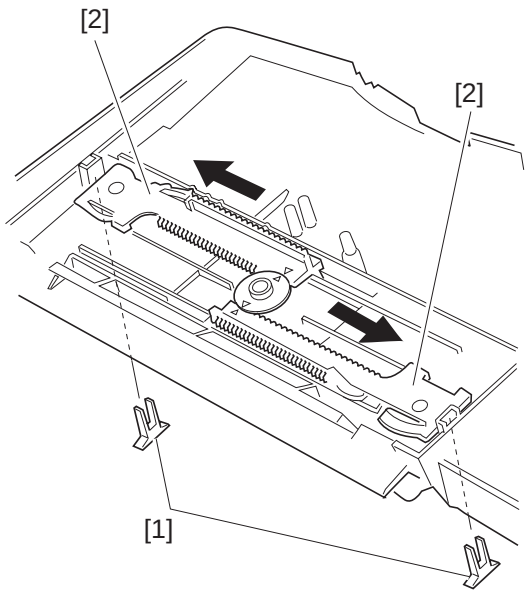


**Figure 3-406**

3) Mount the volume idler gear against the arrow marking.
4) Check to make sure that the click claw of the side guide gear is as shown.

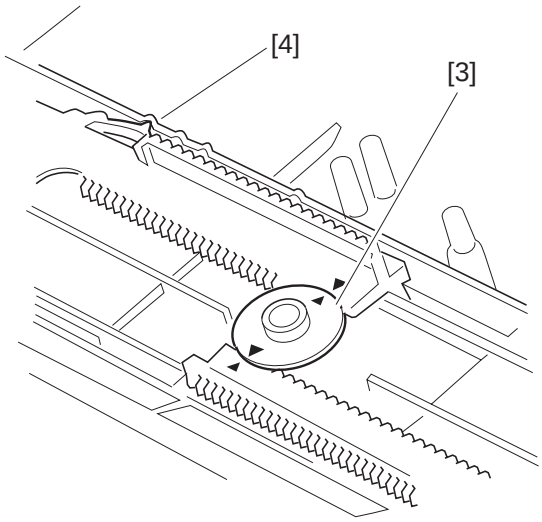


**Figure 3-407**

5) Turn the volume fully in the direction of the arrow [A], and turn it back an equivalent of two teeth [B].

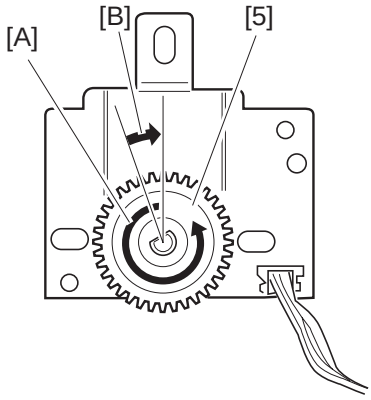


**Figure 3-408**

6) Mount the original width detecting volume with two screws.
7) Mount the grounding wire, and connect the connector.

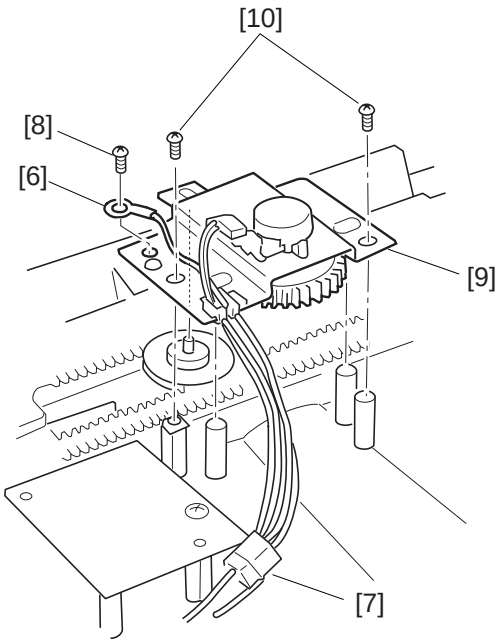


**Figure 3-409**

8) Mount the covers and the width guide roll; then, mount the original pickup tray to the feeder.
9) Perform original tray width adjustment discussed in B. “Electrical System” under I. “Standard and Adjustments” in Chapter 5.


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## E. Removing the Pre-Registration Sensor (U502)

1) Remove the pickup unit. (See A. "Removing the Pickup Unit" under II. "Drive System.")
2) Remove the two mounting screws [2], and detach the pickup lower cover [1].

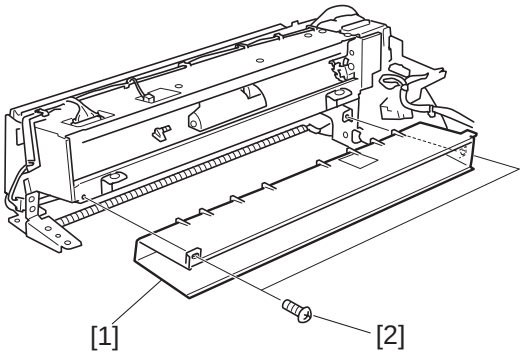


**Figure 3-410**

3) Open the pickup unit cover; then, remove the two mounting screws [2], and detach the pre-registration sensor PCB mounting stay [1].
4) Disconnect the connector [5]; then, remove the two mounting screws [4], and detach the pre-registration sensor PCB [3].

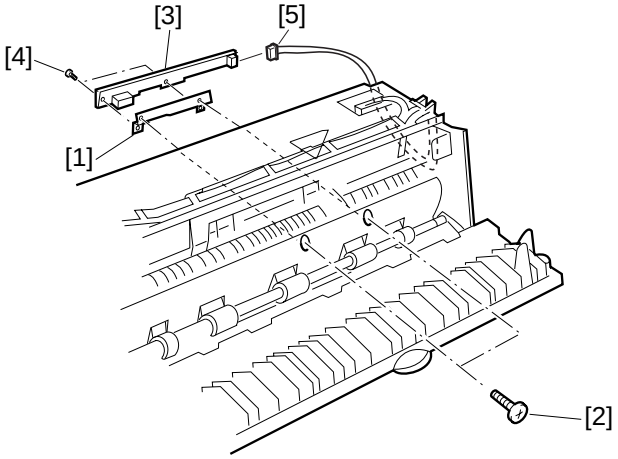


**Figure 3-411**

## F. Removing the Reversal Outlet Sensor (U505)

1) Remove the reversal delivery unit. (See E. "Removing the Reversal Delivery Unit" under II. "Drive System.")
2) While pushing down the reversal inside guide [1] with your finger, remove the mounting screw [3].
3) Slide the reversal outlet sensor PCB [2] halfway up; then, disconnect the connector [4].

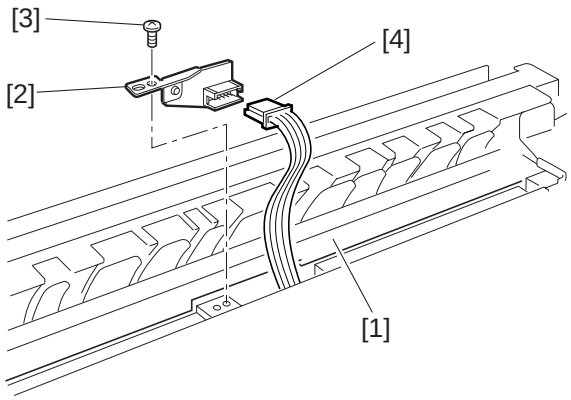


**Figure 3-412**

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# CHAPTER 4

# MAINTENANCE AND SERVICING


I. PERIODICALLY REPLACED PARTS ..... 4-1
II. CONSUMABLES AND DURABLES ..... 4-1
III. SCHEDULED SERVICING CHART ..... 4-2


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# I. PERIODICALLY REPLACED PARTS

The ADF does not have parts that must be replaced on a periodical basis.

# II. CONSUMABLES AND DURABLES

Some parts of the ADF need replacement once or more over the period of product guarantee because of deterioration or damage. Replace them when they prove to be faulty.

As of March. 1999

| No. | Parts | Parts No. | Q'ty | Life (copier) | Remarks |
|---|---|---|---|---|---|
| 1 | Feed belt | FB4-6934 | 1 | 120,000 | Replace it dirt cannot be removed. |
| 2 | Separation roller | FB5-0466 | 1 | 180,000 | Based on the actual number of sheets dealt with. |
| 3 | Separation pad | FF5-9160 | 1 | 60,000 | |
| 4 | Pickup roller | FB4-1151 | 1 | 120,000 | |

**Tale 4-201**

**Note:**

The above values do not indicate the copier's counter readings, but the actual numbers of sheets that have been deal with. Further, they are estimates only and are subject to change based on future data.

Be sure to check this reading (actual number) in the copier's service mode: COPIER>COUNTER>FEEDER-FEED. (For details, see B-4 "COUNTER" in Chapter 5.)

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# III. SCHEDULED SERVICING CHART

**Caution:**
Do not use solvents or oils not shown herein.

△:Clean ●:Replace ×:Lubricate □:Adjust ◎:Inspect

| No. | Parts | Scheduled servicing | | | Remarks |
|---|---|---|---|---|---|
| | | every 60,000 or 6 mon | every 60,000 or 1 yr | every 120,000 copies | |
| 1 | Last original sensor (U504) | | △ | | Remove the sensor, and dry wipe it. |
| 2 | Pre-registration sensor (U502) | | △ | | |
| 3 | Pickup roller | △ | | | |
| 4 | Registration roller | △ | | | |
| 5 | Feed roller | △ | | | |
| 6 | Reversal delivery roller | △ | | | |
| 7 | Retaining roll | △ | | | |
| 8 | Drive roller | | | △ | Clean with alcohol when replacing the feed belt (120,000 copies). |

**Table 4-301**

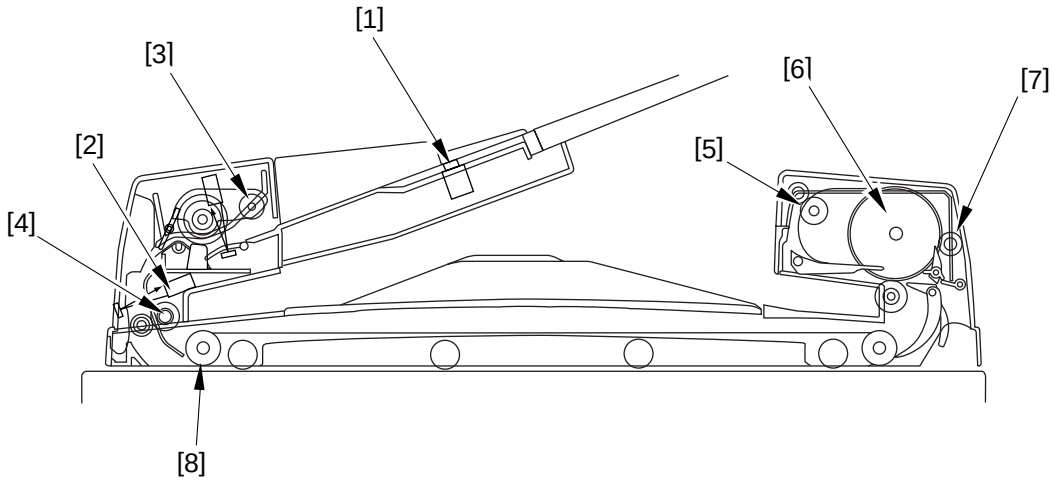


**Figure 4-301**


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# CHAPTER 5

# TROUBLESHOOTING


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# I. STANDARDS AND ADJUSTMENTS

## A. Mechanical System

The major adjustments of the ADF are made using its host copier's service mode. For all adjustments using the DIP switch on the ADF controller PCB, see V.C. "DIP Switch Functions."

### 1 Selecting Service Mode

1) Press the User Mode key '⊛' on the control panel.
2) Press '2' and '8' on the keypad at the same time.
3) Press the User Mode key '⊛' once again.
   · The display will show the following screen.

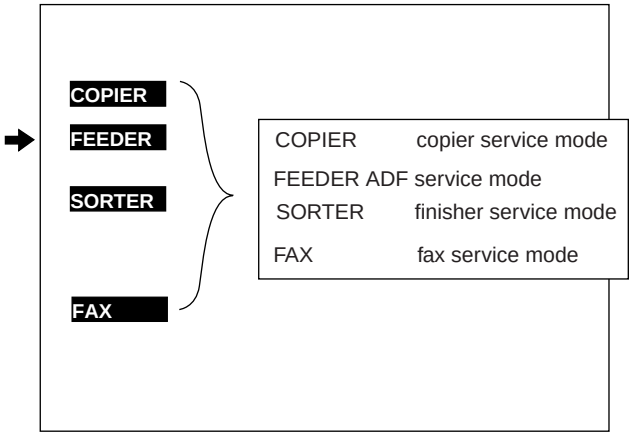



**Figure 5-101**

### 2 Correcting the Original Skew

1) Set the copier to service mode.
2) Select FEEDER>ADJUST>DOCST (for functions).

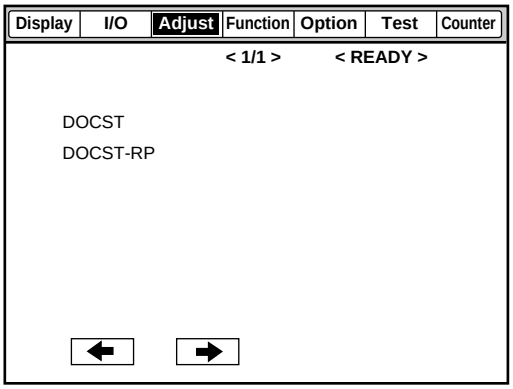
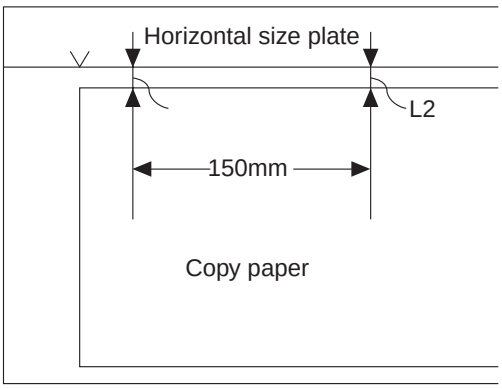



**Figure 5-101-1**

3) Place one original (A3 or 11x17) on the original tray, and press 'OK'.
   The original will be moved to and stopped on the copyboard glass.
4) Open the ADF, and check the position of the original on the copyboard glass.
   Check to make sure that the difference between L1 and L2 in the figure is 1 mm or less.




* L1 may be anywhere as long as it is on the copy paper.

**Figure 5-102**

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5) If the difference is not as indicated, loosen the nut found at the rear of the right hinge unit.

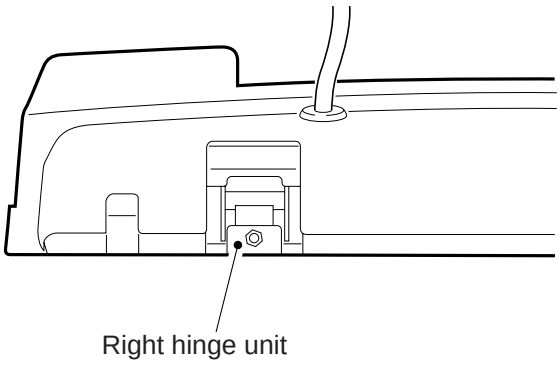


**Figure 5-103**

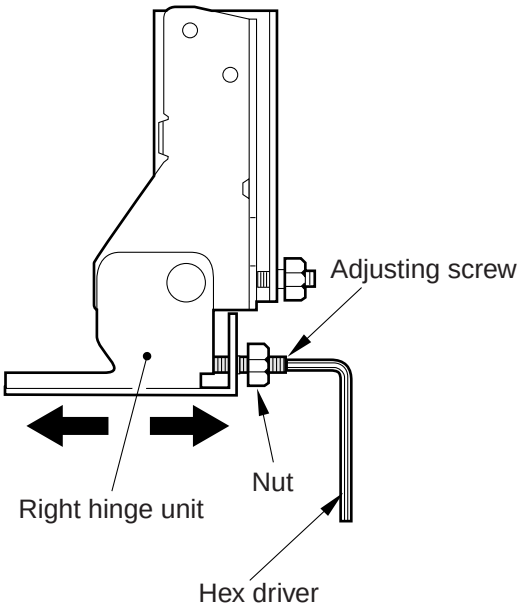


**Figure 5-103-1**

6) Make adjustments by turning the adjusting screw (hex) so that $\ell_1$ to $\ell_2$ is as indicated.

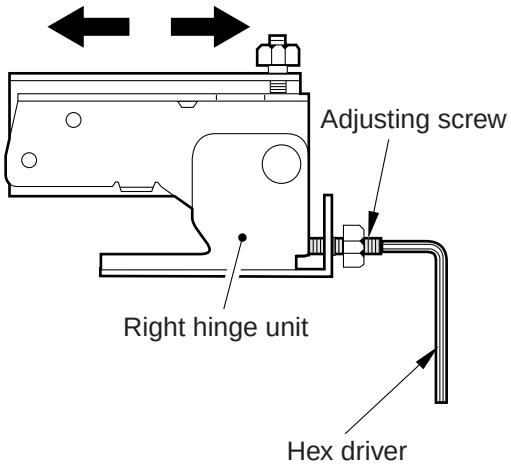


**Figure 5-104**

Relationship between $\ell$ and $\ell_2$ and the Adjusting Screw

| Direction of rotation | Relationship between $\ell_1$ and $\ell_2$ |
|---|---|
| Clockwise direction | $\ell_1 < \ell_2$* |
| Counterclockwise direction | $\ell_1 < \ell_2$ |

Range: ±2.0 mm
(The adjusting screw may be given a maximum of 2 turns.)
The feeder will not move; after turning the adjusting screw, be sure to move the feeder by hand.

**Table 5-101**

7) After adjustment, tighten the nut to secure the adjusting screw in place.


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## 3 Adjusting the Position of the Reversal Delivery Flapper

If a double-sided original tends to jam or fold into a Z in the duplexing feeding assembly, adjust the position of the reversal delivery flapper as follows:

1) Remove the four mounting screws, and detach the front cover. (See A. "External Covers" under I. "Basic Construction.")
2) Open the reversal delivery unit cover [1], and loosen the screw [2] shown in the figure.

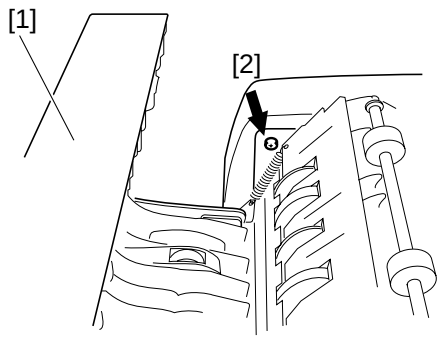


**Figure 5-105**

3) Open the ADF slowly, and turn the reversal delivery roller [3] counterclockwise in the direction of [A] (working from where the reversal delivery unit cover was) so that the reversal delivery flapper [4] is as shown .

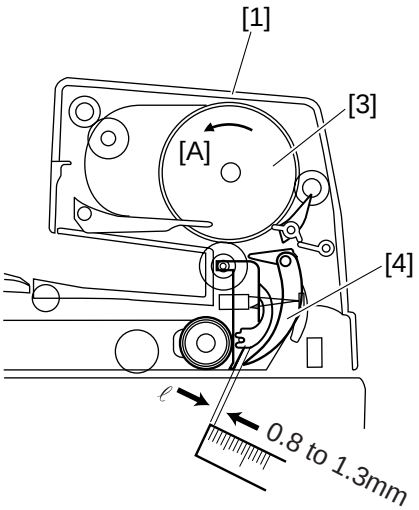


**Figure 5-106**

4) If ℓ is not as indicated, turn the adjusting screw [5] to adjust the position of the reversal delivery flapper.
   If it is too narrow, turn the adjusting screw clockwise; if too wide, on the other hand, turn it counterclockwise.
   Standards: ℓ = 0.8 to 1.3 mm
   (THICKNESS GAUGE)
   If ℓ is not as indicated, the following symptoms tend to occur; be sure to make adjustments so that it is as indicated:
   - If it is less than 0.8,
     double-sided originals will tend to move askew.
   - If it is more than 1.3,
     originals with a bent leading edge (downward) tend to get hooked on the reversal inlet assembly.
5) Tighten the screw [2] of the reversal delivery unit, and close the reversal delivery unit cover [1].
6) Mount the front cover.

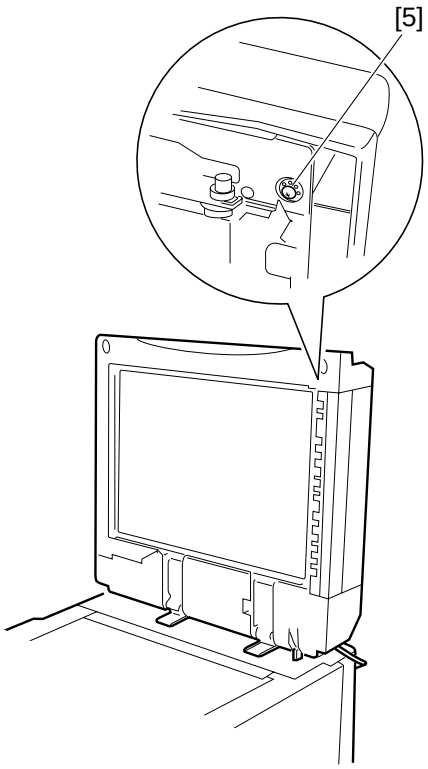


**Figure 5-106-1**

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# B. Electrical System

## 1 When Replacing the Major Parts

| Major parts | Work |
|---|---|
| ADF controller PCB | 1. EEPROM initialization<br>2. Original tray width adjustment (A/B-configuration, inch-configuration)<br>3. Sensor level adjustment<br>4. Registration position adjustment<br>5. Duplexing registration adjustment |
| Last original sensor (U504)<br>Original set sensor (U503)<br>Pre-registration sensor (U502)<br>Reversal outlet sensor (U505) | 1. Sensor level adjustment |
| Original width detecting volume (U508) | 1. Original pickup tray width adjustment |

**Table 5-103**

### 2 EEPROM Initialization

1) Remove the ADF controller cover, and shift bits 4, 5, and 6 of the DIP switch (DSW1) on the ADF controller PCB to ON.
2) Open the pickup unit cover.

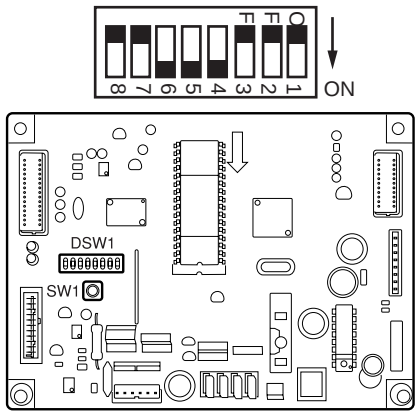


**Figure 5-107**

3) While holding down the push switch, turn off and then on the copier.
   This will initialize the backup data of the EEPROM.
4) Check to make sure that LED2 is on.
5) Close the pickup unit cover, and shift all bits of the DIP switch (DSW1) to OFF.
6) Turn off the copier; then, turn it on once again.

**Caution:**

If you have replaced the ADF controller PCB once again, be user to initialize the EEPROM first.


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## 3 Original Tray Width Adjustment (A/B-configuration, inch-configuration)

1) If for A/B-configuration, place an A4 original on the original tray.
   If for inch-configuration, place an LTR original on the original tray.
   Then, set the slide guides to the original.
2) Remove the ADF controller cover, and shift bits 3 and 4 of the DIP switch (DSW1) on the ADF controller PCB to ON; then, press the push switch (SW1).

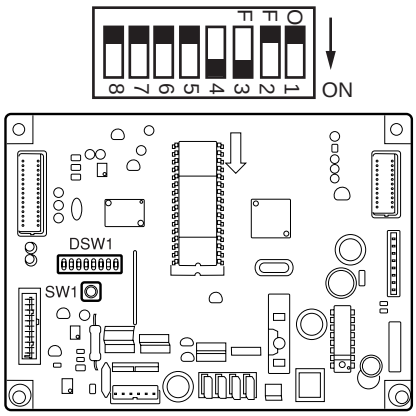


**Figure 5-108**

3) Check to make sure LED1 on the ADF controller PCB is on.
4) If for A/B-configuration, set the slide guides to A4R size.
   If for inch-configuration, set the slide guides to LTRR size.
5) Press the push switch (SW1) on the ADF controller PCB.
   Check to make sure that LED2 on the ADF controller PCB has turned on.
6) Press the push switch (SW1) on the ADF controller PCB.
7) Shift all bits of the DIP switch (DSW1) to OFF.

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## 4 Sensor Lever Adjustment (sensitivity adjustment)

Perform the following when you have replaced the ADF controller PCB, original set sensor (U503), last original sensor (U504), pre-registration sensor (U502), or reversal outlet sensor (U505):

1) Put a solid black sheet of paper over the last original sensor of the original pickup tray. At this time, take care so that the black sheet will not cover the original set sensor.
2) Set the copier to service mode. (Keep the ADF closed.)
3) Select FEEDER>FUNCTION>SENS INT.
4) Press 'OK'.
   In about 15 sec, the original detection LED flashes twice; the notation 'SERVICE' on the display changes to 'READY' to indicate the end of auto adjustment.
   During automatic adjustment, the message 'SERVICE' will appear in the upper right corner of the display.
   (i.e., the message 'SERVICE' on the display changes to 'READY').

## 5 Registration Adjustment

1) Start service mode.
2) Select FEEDER>ADJUST>KDOCST.
3) Place an original (A3 or 11x17) on the original tray, and press 'OK'.
   · The original will be moved to and stopped on the copyboard glass.
4) Open the ADF, and check the position of the original on the copyboard glass.
   This is only to check the position of the original. Adjustment will be in step 6).

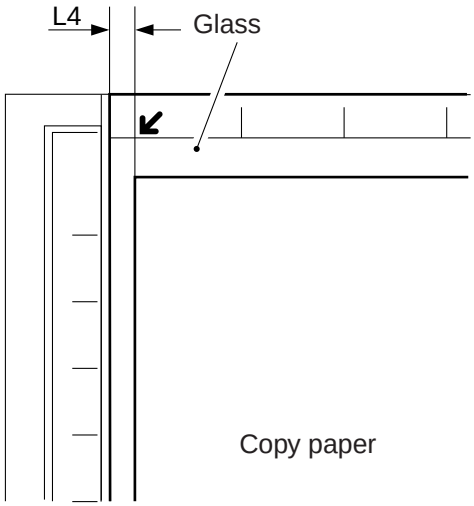


**Figure 5-109**

5) Close the ADF, and press 'OK'.
   · The original is moved from the copyboard and discharged.

**Caution:**

If you remove the original from the copyboard glass by hand while making adjustment, the Jam message will appear. Be sure to use the foregoing method to discharge it.


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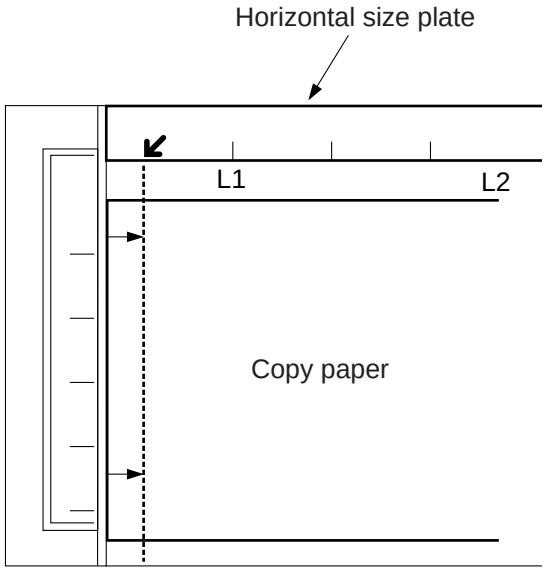
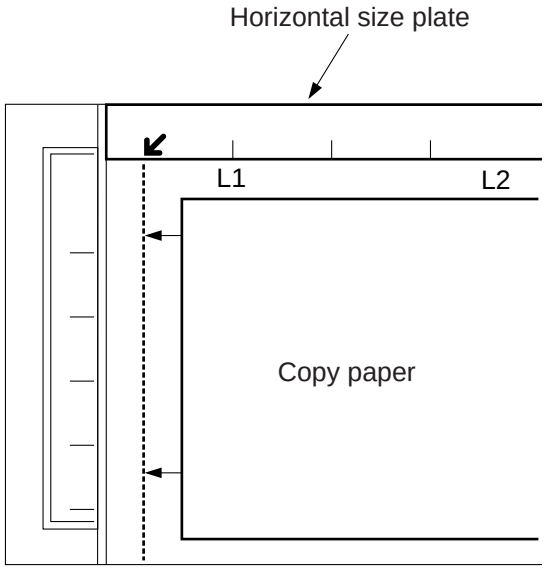
6) Enter the appropriate value (number of pulses) to indicate the direction of movement using the keypad.
Use the number of pulses, a single pulse being the equivalent of 0.34 mm. Increase the value if the original was on the left of the V marking for a shift to the right; decrease the value, on the other hand, if the original was on the right of the V marking for a shift to the left.




Decrease DOC-ST




Increase DOC-ST

**Figure 5-109-1**

7) Place an original (A3 or 11x17) on the original tray, and press 'OK' once again.
   · The original will be moved to and stopped on the copyboard glass.
8) Open the ADF, and check the position of the original on the copyboard glass.
9) Close the ADF slowly, and press 'OK'.

**Caution:**

The setting will be stored in memory when the original is discharged. Be sure to use the foregoing method to discharge the original whenever you have changed the setting.

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## 6 Duplexing Registration Adjustment

1) Start service mode.
2) Select FEEDER>ADJUST>DOCST-RP.
3) Perform steps 3) through 9) under 5. "Adjusting Registration."

## 7 Cleaning the Separation Roller

1) Start service mode. (Keep the ADF closed.)
2) Select FEEDER>FUNCTION>DBLT-CLN.
3) Place one sheet of copy paper on the original tray. At this time, place it as if to push the paper into feeding direction.
4) Press 'OK'.
   The copy paper will be picked up halfway, and the separation roller is rotated idly. Hold down the paper against the original pickup tray to prevent it from moving ahead.
5) In about 5 sec, the separation roller will stop to rotate automatically. If you have to stop it before that, press the OK key.
   Check to make sure that the notation in the upper right of the Service Mode screen is 'READY'. If 'SERVICE' is indicated, press the OK key once again.
6) Open the pickup unit cover, and remove the copy paper.

## 8 Cleaning the Registration Roller

To remove paper lint or dirt from the registration roller, perform the following on a periodical basis according to the intervals indicated in the Scheduled Servicing Chart:

1) Shift bits 1, 2, 5, and 6 of the DIP switch on the ADF controller PCB to ON.

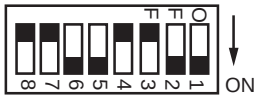


**Figure 5-110**

2) Press the push switch. Check to make sure that the original detection LED turns on.
3) Close the ADF. Check to make sure that the pickup unit cover and the reversal delivery unit cover are closed.
4) Open the pickup unit cover so that the registration roller will rotate 40 sec (in reverse; it will stop automatically).
5) Put lint-free paper or cloth moistened with alcohol lightly against the registration roller.
6) To stop, perform the following:
   - Close the pickup unit cover.
   - Open the ADF.
   - Open the reversal delivery unit cover.

   If any of the conditions applies or in 40 sec after the registration roller started to rotate, cleaning mode will end automatically.
7) Shift all bits of the DIP switch to OFF.


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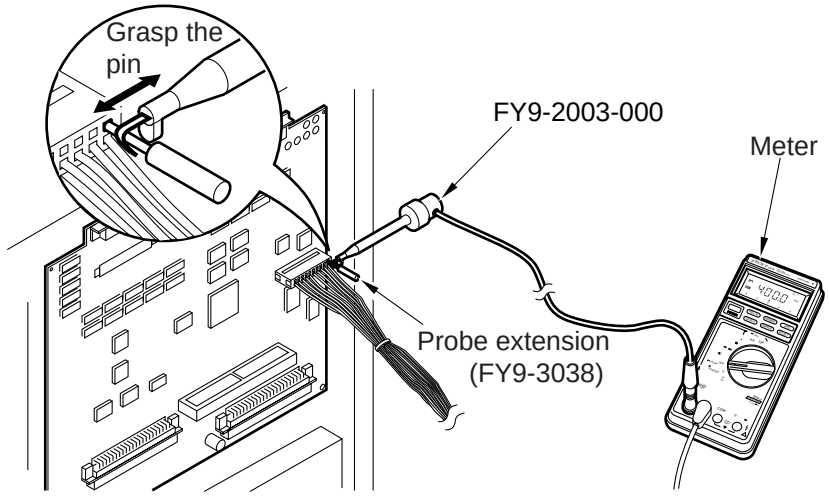
# II. TROUBLESHOOTING

You cannot directly fit the probes of a meter into the connectors (J6, J7) of the PCB of the ADF. (The connectors are designed in a special way to ensure good connection.) If you must check the connector J6 or J7 on the ADF controller PCB when performing troubleshooting work, be sure to obtain a probe extension (FY9-3038-000, FY9-3039-000).

1) Set the meter to the DC range.
2) Connect the probe of the meter to GND (0 VDC) on the ADF controller PCB.
3) Set the probe extension as follows:

[ Method 1 ]




[ Connection 2 ]

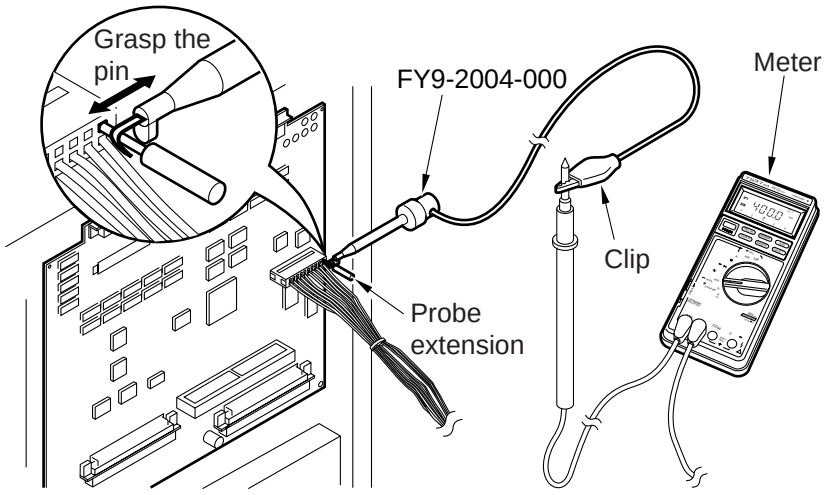



**Figure 5-201**

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# A. Troubleshooting Malfunctions

**Caution:**

If no operation occurs in response to the push switch, be sure to turn off the main power as soon as possible when using the DIP switch on the ADF controller PCB to make a check.

## 1. E400/E712

| Cause | Step | Checks | Yes/No | Action |
|---|---|---|---|---|
| | 1 | Turn off and then on the power switch. Is the problem corrected? | YES | End. (Check the wiring between the copier's image processor PCB and the ADF controller PCB.) |
| Wiring | 2 | Set the meter to the DC (V) range, and connect its probes to the following terminals. Is the voltage about 24 V for each?<br>\ / + probe / - probe<br>1 / J2-1 / J2-2<br>2 / J1-6 / J1-7 | NO | Check the wiring for the power supplied by the copier. |
| ADF controller PCB | 3 | Replace the ADF controller PCB. Is the problem corrected? | YES | End. |
| | | | NO | Replace the copier's image processor PCB. |

**Table 5-201**

## 2. E402

| Cause | Step | Checks | Yes/No | Action |
|---|---|---|---|---|
| Feed motor clock sensor (SR1) | 1 | Set the meter to the DC (V) range, and connect its + probe to the connector J6A0-2 and its - robe to the connector J6A-1. Does the voltage alternate between 5 and 0 V when the feed belt is moved slightly by hand? | NO | Check the wiring from the feed motor clock sensor to the AD controller PCB; if normal, replace the feed motor clock sensor. |
| Drive mechanism (gear, belt; damage) | 2 | Does the gear, motor, and belt operate smoothly when the feed belt is moved clockwise/ counterclockwise? | NO | Check the gear and the belt. |
| Feed motor (M2) | 3 | Set the meter to the DC (V) range, and connect its + probe to J5-4 and its - probe to J5-3 on the ADF controller PCB. Shift bits 2, 5, 6, and 7 of the DIP switch, and press the push switch. Is the reading of the meter about 24 V when the ADF open/closed detecting lever is pushed?<br>· To stop the ongoing operation, Press the push switch. At the end of the operation, be sure to shift all bits of the DIP switch to OFF. | YES | Check the wiring from the feed motor to the ADF controller PCB; if normal, replace the feed motor. |
| | | | NO | Replace the ADF controller PCB. |

**Table 5-202**


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## 3. E404

| Cause | Step | Checks | Yes/No | Action |
|---|---|---|---|---|
| Reversal delivery motor clock sensor (SR7) | 1 | Set the meter to the DC (V) range, and connect its + probe to the connector J7B-5 and its - probe to the connector J7B-4. Does the voltage alternate between 5 and 0 V when the clock disk or the reversing roller (after opening the reversal delivery cover) is turned slowly? | NO | Check the wiring from the reversal delivery motor clock sensor to the ADF controller PCB; if normal, replace the reversal delivery motor clock sensor. |
| Drive mechanism (gear, belt; damage) | 2 | Open the reversal delivery cover, and turn the reversing roller clockwise/ counterclockwise. Do the gear, motor, and belt move smoothly? | NO | Check the gear and belt. |
| Reversal delivery motor (M3) | 3 | Set the meter to the DC (V) range, and connect its + probe to the connector J9-1 and its - probe to the connector J9-2 of the ADF controller PCB. Shift bits 2, 5, 6, and 7 of the DIP switch to ON, and press the push switch. Does the reading of the meter change to about 24 V when the ADF open/closed detecting lever is pushed?<br>· To stop the ongoing operation, Press the push switch. At the end of the operation, be sure to shift all bits of the DIP switch to OFF. | YES | Check the wiring from the reversal delivery motor to the ADF controller PCB; if normal, replace the reversal delivery motor. |
| | | | NO | Replace the ADF controller PCB. |

**Table 5-203**

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# III. ARRANGEMENT OF THE ELECTRICAL PARTS

## A. Motors, Solenoids, and Sensors

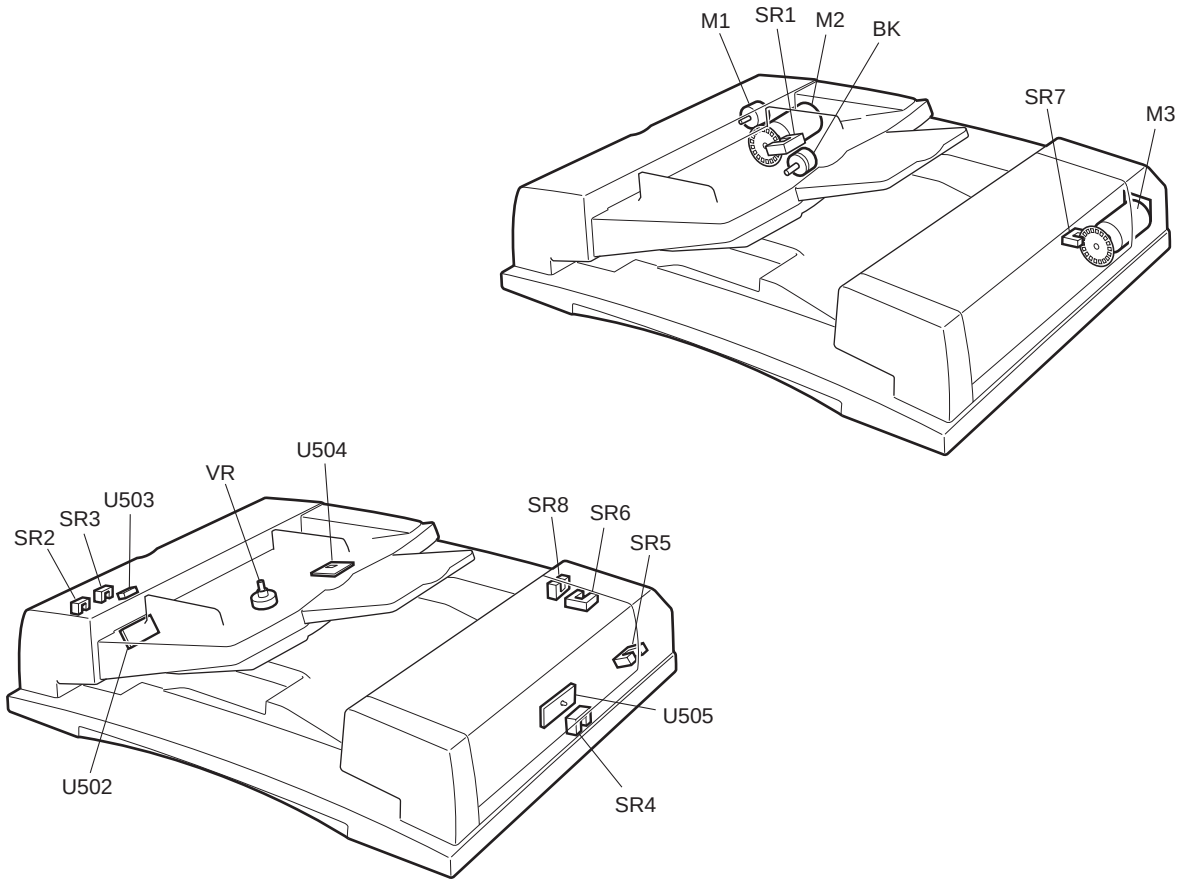


**Figure 5-301**


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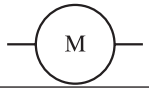
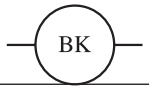
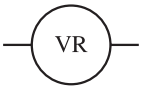
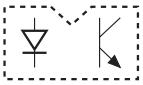
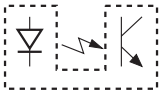
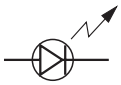
| Symbol | Name | Notation | Description |
|---|---|---|---|
|  | Motor | M1<br>M2<br>M3 | Separation motor<br>Feed motor<br>Reversal delivery motor |
|  | Brake | BK | Feed motor brake |
|  | Variable resistor | VR | Original width detecting volume |
|  | Phototransistor | U502<br>U503<br>U504<br>U505 | Pre-registration sensor<br>Original set sensor<br>Last original sensor<br>Reversal outlet sensor |
|  | Photointerrupter | SR1<br>SR2<br>SR3<br>SR4<br>SR5<br><br>SR6<br>SR7<br>SR8 | Feed motor clock sensor<br>Pickup unit cover sensor<br>Separation sensor<br>Reversal delivery inlet sensor<br>Reversal delivery registration sensor/ delivery sensor<br>ADF open/closed sensor<br>Reversal delivery motor clock sensor<br>Reversal delivery unit cover sensor |
|  | LED | LED301<br>LED302 | Original Set indicator |

**Table 5-301**

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## B. PCBs

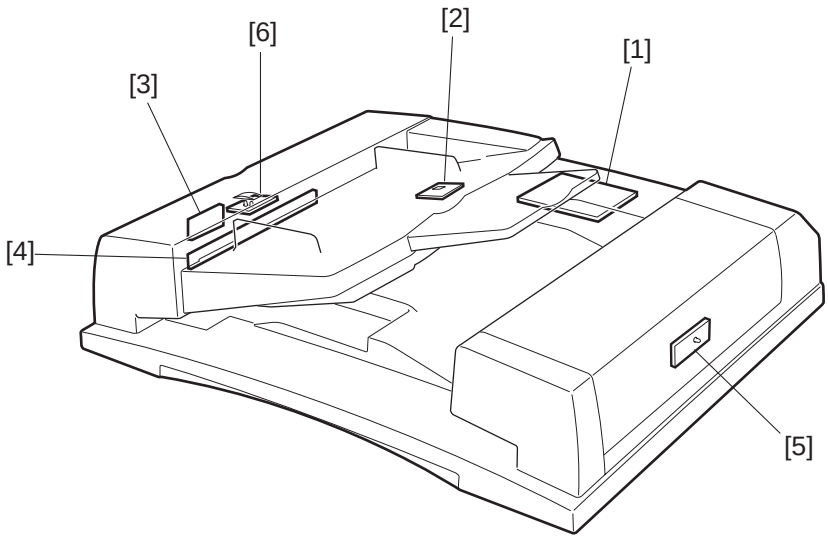


**Figure 5-302**

| Reference | Name |
|---|---|
| 1 | ADF control |
| 2 | Last original sensor (U504) |
| 3 | Original Set sensor (U503) |
| 4 | Pre-registration sensor (U502) |
| 5 | Reversal outlet sensor (U505) |
| 6 | Original set indicator |

**Table 5-302**


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# IV. VARIABLE RESISTORS (VR), LIGHT-EMITTING DIODES, AND CHECK PINS BY PCB

Of the variable resistors (VR), light-emitting diodes (LED), and check pins used in the machine, those needed for servicing in the field are discussed.

**Caution:**

Do not touch those VRs and check pins not discussed herein. They are for the factory, and require especial instruments and high accuracy.

## A. ADF Controller PCB

· Check Pins on the ADF Controller PCB

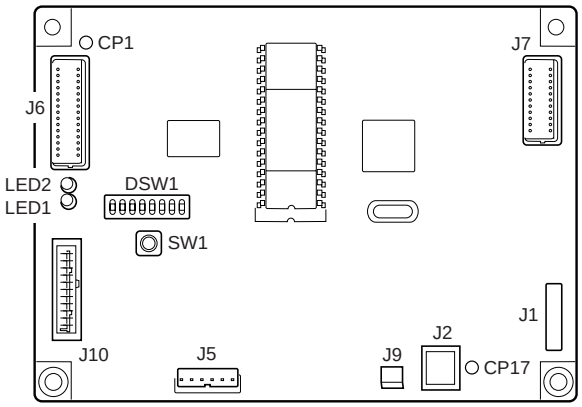



**Figure 5-401**

| Check pin | Checks |
|---|---|
| CP1 | GND |
| CP17 | GND |

**Table 5-401**

· Normal Operating Mode

| | State of LED | State of LED2 |
|---|---|---|
| ADF at reset | Flashes every 100 msec | OFF |
| Error | Alternately flashes every 150 msec | |
| Alarm | Alternately flashes every 800 msec | |
| Jam | Alternately flashes every 400 msec | |
| Others | Off | |

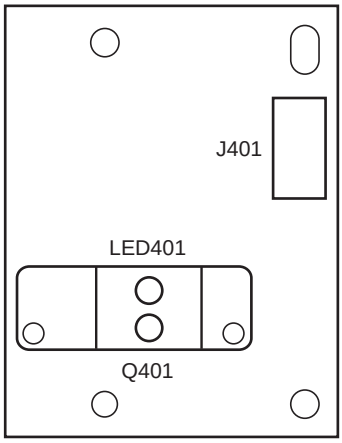
· Test Mode by DIP SW

For a guide to LED indication in test mode, see V.C. "Using the DIP Switch."

**Caution:**

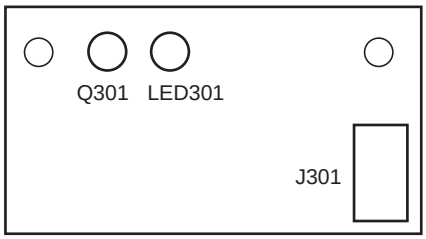
Some LEDs emit light even when they are off because of leakage current. This is a normal condition, and must be kept in mind.

## B. Sensor PCBs




Last Original Sensor PCB

**Figure 5-402**




Original Set Sensor PCB

**Figure 5-403**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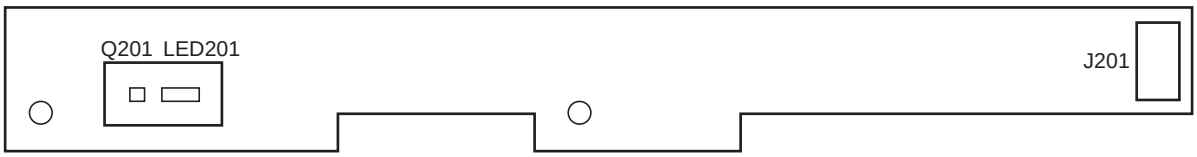
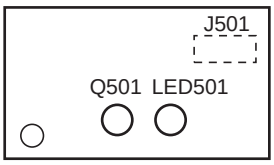



Pre-Registration Sensor PCB

**Figure 5-404**




Reversal Outlet Sensor PCB

**Figure 5-405**

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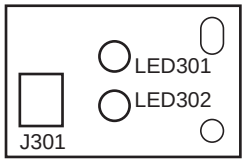
## C. Indicator PCB




Original Set Indicator LED PCB
**Figure 5-406**

| LED | Description |
|---|---|
| LED301 | Indicates the presence of an original. |
| LED302 | Indicates the presence of an original. |

**Table 5-401 LEDs on the Indictor PCB**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# V. SERVICE MODE AND DIP SWITCH

## A. Outline

The ADF provides two types of service modes: one accessed from the copier's LCD control panel, and one accessed from the DIP switch on the ADF controller PCB.

The following are service mode items available with the ADF; use the DIP switch or the copier's service mode as appropriate. For details of the DIP switch settings, see IV.D. "Using the DIP Switch."

| Item | Service mode | | DIP SW |
|---|---|---|---|
| Sensor level adjustment | ○ | FEEDER>Function>SENS-INIT | ○ |
| Original tray width adjustment | — | | ○ |
| 1st page registration position adjustment | ○ | FEEDER>Adjust>DOCST | ○ |
| Duplexing (2nd side) registration position adjustment | ○ | FEEDER>Adjust>DOCST-RP | ○ |
| Pickup/delivery step operation | — | | ○ |
| Continuous pickup operation | — | | ○ |
| Pickup operation (in the absence of an original) | — | | ○ |
| Pickup roller cleaning operation | ○ | FEEDER>Function>DBLT-CLN | ○ |
| Lifter descent | — | | ○ |
| Lifter ascent | — | | ○ |
| I/O | ○ | COPIER>I/O>FEEDER | — |
| EEPROM initialization | — | | ○ |
| Counter | ○ | COPIER>COUNTER>FEEDER | — |

○ : Can be used or displayed
— : Cannot be used or displayed

When the ADF is installed, the copier's following service mode item will be disabled: COPIER>OPTION>BODY>FACE-DWN.

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## B. Service Mode

For details of how to use service mode, see the copier's Service Manual.

### 1. Starting Service Mode

1) Press the User Mode key '⊛' on the copier's control panel.
2) Press '2' and '8' on the key pad at the same time.
3) Press the User Mode key '⊛' once again.

· The following screen will appear. To use an ADF-related item, select FEEDER on the screen.

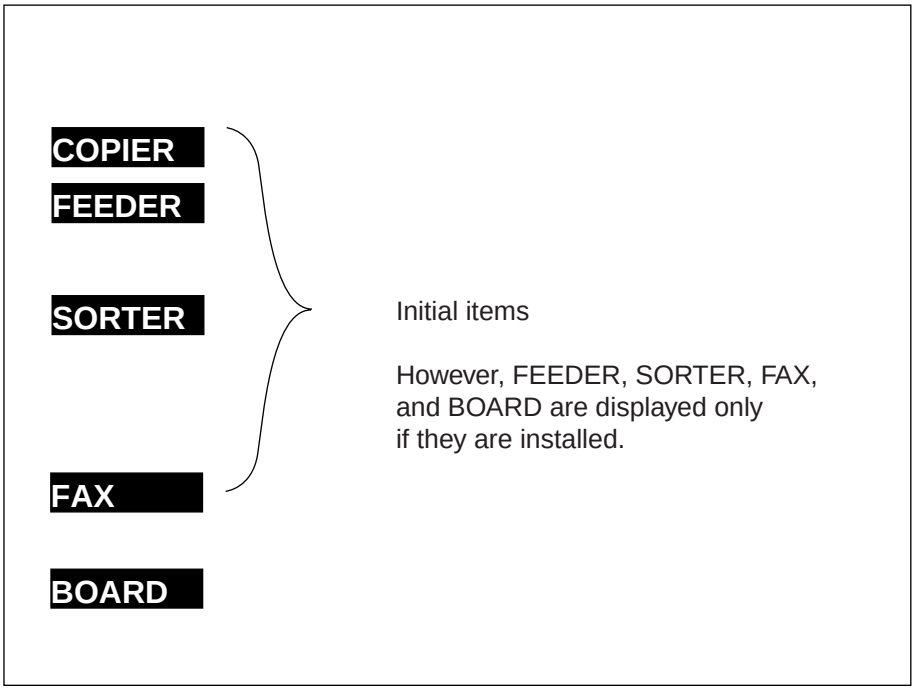


**Figure 5-501**


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## 2. FEEDER

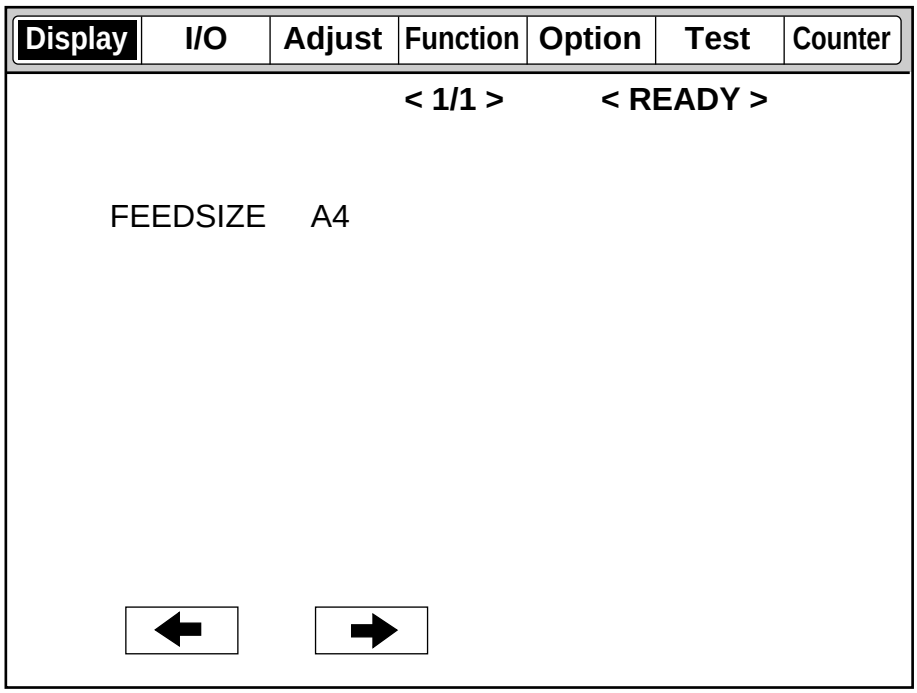


**Figure 5-502**

**FEEDER Items**

| Level 1 | Level 3 | Description |
|---|---|---|
| DISPLAY | FEEDSIZE | indicates the size of the original detected by the feeder |
| ADJUST | DOCST | adjusts the original stop position for top pickup |
| | DOCST-RP | adjusts the original stop position for bottom pickup |
| FUNCTION | SENS-INIT | executes sensor auto sensitivity adjustment (initialization) for the ADF |
| | DBLT-CLN | executes separation roller cleaning mode for ADF |
| OPTION | SIZE-SW | turns on/off the mix size detecting mechanism (AB/inch-configuration originals) |
| | SCAN-SEL | turns on/off the mix size detecting mechanism (non-default originals) |

Note: For FEEDER, you cannot make use of the I/O, Test, or Counter mode items. For I/O, select COPIER>I/O>FEEDER.

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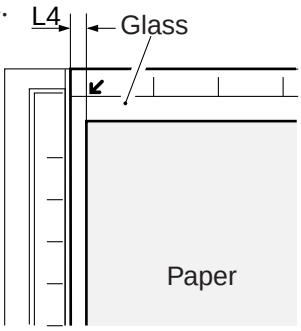
## DISPLAY FEEDER

| Level 3 | Description | Remarks |
|---|---|---|
| FEEDSIZE | Use it to indicate the size of the original detected by the feeder during the previous job.<br>If the feeder has not been used after the main power was turned off and on, '.....' is indicated.<br>Indication sample: A4, LTR | |

## ADJUST

| Level 3 | Description | Remarks |
|---|---|---|
| DOC-ST | Use it to adjust the original stop position for 1-on-1 pickup.<br>■ Using the Item (Perform step 2 to make adjustments.)<br>1. Checking the original Stop Position<br>1) Select the item.<br>2) Place one original on the original tray of the feeder, and press 'OK'.<br>3) See that the original is picked up, fed, and stopped on the copyboard glass.<br>4) Open the feeder, and check the original stop position on the copyboard glass.<br>If the original is to the left of the V marking, increase the setting.<br>If the original is to the right of the V marking, decrease the setting.<br>5) Close the feeder, and press 'OK' so that the original will be discharged.<br>Be sure to discharge the original only in this way. If you remove it manually, the display will indicate the Jam message (Note).<br>Standard: stop position L4 = 11.0 ±1 mm<br>L4 being the distance of the edge of the original from the edge of the glass.<br>  <br><br>2. Adjusting the Original Stop Position<br>1) Place an original on the feeder original tray.<br>2) Enter the value obtained in step 1) on the control panel, and press the OK key.<br>· In several seconds, the original will be moved automatically.<br>3) Close the feeder, and press 'OK so that the original will be discharged.<br>Be sure to discharge the original this way (by pressing 'OK'); otherwise, the setting will not be stored in memory. | Unit: 0.34 mm<br>Factory default: 0 |

Note: If a jam has occurred because of this operation, be sure to open and close the feeder and the reversal assembly cover as part of jam removal.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FEEDER

| Level 3 | Description | Remarks |
|---|---|---|
| FEEDSIZE | Use it to adjust the original stop position for duplexing pickup (2nd side of an original).<br>■ Using the Item<br>Use the steps for DOC-ST. However, a different paper path will be used, since this is to adjust the original stop position for duplexing pickup.<br>Note: Any new setting will not be stored in memory until you press 'OK' to discharge the original. Be sure to discharge the original by pressing 'OK'. | Unit: 0.34 mm<br>Factory default: 0 |

## FUNCTION

FEEDER

| Level 3 | Description | Remarks |
|---|---|---|
| FEEDSIZE | Use it to execute automatic sensitivity adjustment for the sensor (initialization).<br>Use this mode when you have replaced the ADF controller PCB, original sensor, pre-registration sensor, pre-cycle end sensor, or reversal outlet sensor. Further, keep in mind that additional steps are needed if you have replaced the ADF controller PCB.<br>This adjustment may be made using the DIP switch on the ADF controller PCB.<br>1) Place a black sheet of paper (solid black) on the tray so that it covers the last original sensor. (Be sure that the paper will not move and it will not cover the original sensor.)<br>2) Select the item, and press 'OK'.<br>· In about 15 sec, the original detection LED flashes twice.<br>While automatic adjustment is under way, 'SERVICE' will appear in the upper right corner of the service mode screen.<br>· This item will end automatically in several seconds (when the indication 'SERVICE' changes to 'READY' on the service mode screen). | For adjustment using the DIP switch, see p. 5-27. |
| DBLT-CLN | Use it to execute separation roller cleaning mode.<br>■ Using the Item<br>1) Select 'DBLT-CLN' to highlight.<br>2) Place copy paper on the tray of the feeder, and set it as if to push it slightly in feeding direction.<br>You nee not moisten the copy paper with solvent.<br>3) Press 'OK'. Let the copy paper move halfway in while holding it in place (causing the separation roller to rotate idly).<br>4) In about 5 sec, the operation will stop automatically.<br>To stop manually before that, press the OK key.<br>5) Open the left cover of the feeder, and remove the paper.<br>6) If you have let the mode stop automatically, press the OK key once; then, check to make sure that the notation in the upper right of the Service Mode screen changes from 'SERVICE' to 'READY'. (If 'READY', the mode has ended.) | |

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OPTION FEEDER

| Level 3 | Description | Remarks |
|---|---|---|
| SIZE-SW | Use it to enable or disable the mechanism used to detect mixing of papers of different sizes (AB/inch).<br>0: OFF (disable)<br>1: ON (enable) | Factory default: 0 |
| SCAN-SEL | Use it to enable or disable the mechanism used to detect mixing of papers of different sizes (non-default).<br>0: OFF (non-default size not detected)<br>1: ON (non-default size detected) | Factory default: 0 |


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### 3. I/O Display

1) Start service mode.
2) Press COPIER and I/O, and then select FEEDER from the Display screen. See the following for a guide to the bit numbers:

P001 00000000
bit 7 bit 0

| Address | bit | Description | Signal | Connector | Remarks |
|---|---|---|---|---|---|
| P001 | bit0 | Reversal delivery registration sensor (SR5) | EREG | J7A-6 | If '1', paper present. |
| | bit1 | Reversal delivery inlet sensor (SR4) | EENT | J7A-3 | If '1', paper present. |
| | bit2 | Separation sensor (SR3) | SPR* | J6A-9 | If '0', paper present. |
| | bit3 | Original Set sensor (light-emitting; U503) | EMPLED | J6A-14 | If '0', paper present. |
| | bit4 | | | | |
| | bit5 | | | | |
| | bit6 | | | | |
| | bit7 | | | | |
| P002 | bit0 | | | | |
| | bit1 | | | | |
| | bit2 | | | | |
| | bit3 | | | | |
| | bit4 | | | | |
| | bit5 | IPC read signal | | | |
| | bit6 | IPC write signal | | | |
| | bit7 | | | | |
| P003 | bit0 | Reversal outlet sensor (light-receiving; U505) | TURN | J7A-7 | If '0', paper present. |
| | bit1 | Pre-registration sensor (light-receiving; U502) | ENT | J7B-3 | if '0', paper present. |
| | bit2 | Original Set sensor (light-receiving; U503) | EMP* | J6A-13 | If '0', paper present. |
| | bit3 | Last original sensor (light-receiving; U504) | LAST | J6A-14 | If '1', paper present. |
| | bit4 | | | | |
| | bit5 | Original width detecting volume | WIDE | J6B-9 | |
| | bit6 | Reversal outlet sensor (light-emitting; U505) | TULED | J6B-8 | |
| | bit7 | Pre-registration sensor (light-emitting; U502) | ETLED | J6A-4 | |
| P004 | bit0 | | | | |
| | bit1 | Feed motor clock sensor (SR7) | FMCK | J6A-3 | When the motor rotates, alternately between '1' and '0'. |
| | bit2 | Reversal delivery motor clock sensor (SR1) | EMCK | J6B-6 | When the motor rotates, alternately between '1' and '0'. |
| | bit3 | | | | |
| | bit4 | | | | |
| | bit5 | | | | |
| | bit6 | | | | |
| | bit7 | | | | |

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| Address | bit | Description | Signal | Connector | Remarks |
|---|---|---|---|---|---|
| P005 | bit0 | For EEP-ROM | DI | | |
| | bit1 | For EEP-ROM | CS* | | |
| | bit2 | For EEP-ROM | DO | | |
| | bit3 | | | | |
| | bit4 | For EEP-ROM | SCK | | |
| P008 | bit0 | | | | |
| | bit1 | | | | |
| | bit2 | Push switch 1 | | | |
| | bit3 | Delivery cover sensor (SR8) | ECVR | J7B-9 | When the delivery cover is opened, '0'. |
| | bit4 | Pickup cover sensor (SR2) | SCVR | J6A-6 | When the pickup cover is opened, '0'. |
| | bit5 | DF open/closed sensor | OPEN | J7B-3 | When the ADF is opened, '0'. |
| | bit6 | | | | |
| | bit7 | | | | |
| P009 | bit0 | D/A | EMPLED0 | | |
| | bit1 | D/A | EMPLED1 | | |
| | bit2 | D/A | EMPLED2 | | |
| | bit3 | D/A | EMPLED3 | | |
| | bit4 | D/A | EMPLED4 | | |
| | bit5 | D/A | EMPLED5 | | |
| | bit6 | D/A | EMPLED6 | | |
| | bit7 | D/A | EMPLED7 | | |
| P010 | bit0 | DIP switch (No. 1) | | | |
| | bit1 | DIP switch (No. 2) | | | |
| | bit2 | DIP switch (No. 3) | | | |
| | bit3 | DIP switch (No. 4) | | | |
| | bit4 | DIP switch (No. 5) | | | |
| | bit5 | DIP switch (No. 6) | | | |
| | bit6 | DIP switch (No. 7) | | | |
| | bit7 | DIP switch (No. 8) | | | |


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## 4. COUNTER

The counter used to indicate the number of pickup operations may be displayed in service mode; operate as follows. Be sure to refer to the counter reading at time of scheduled maintenance.

COPIER>COUNTER>FEEDER

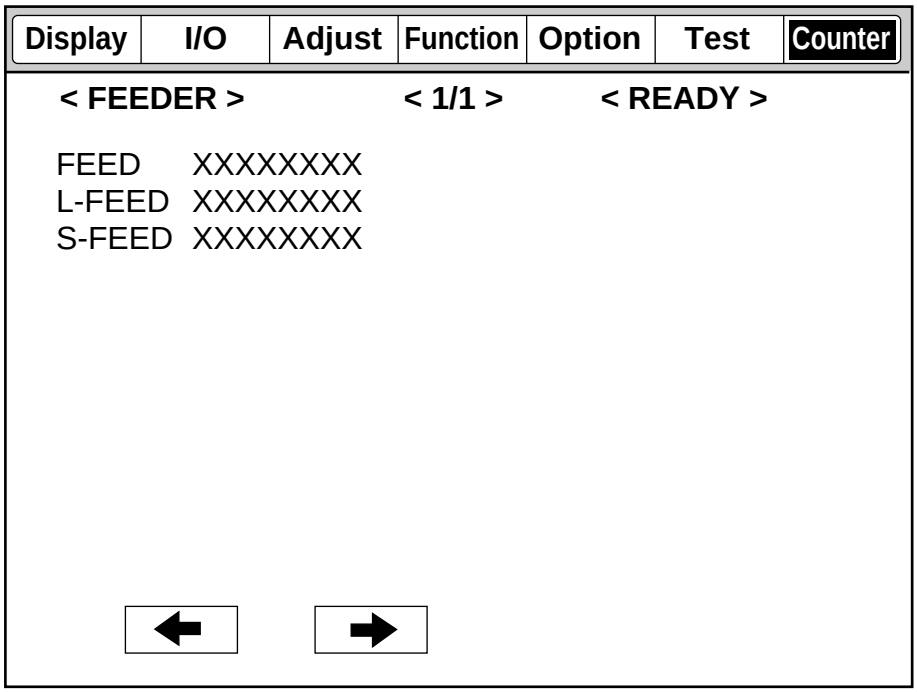


**Figure 5-503**

| | |
|---|---|
| FEED | indicates the number of pickup operations.<br>To check the number of scans made, select<br>COPIER>COUNTER>SCANNER>SC-TTL. |
| L-FEED | indicates the number of pickup operations for large-size paper. |
| S-FEED | indicates the number of pickup operations for small-size paper. |

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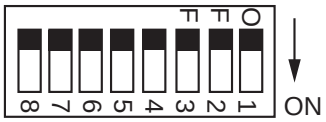
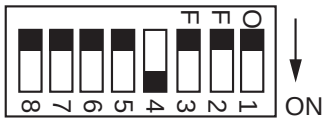
## C. Using the DIP Switch

The following table shows the functions of the DIP switch (DSW1) on the ADF controller PCB.

| Item | Setting | Description |
|---|---|---|
| Normal operation |   | When all bits are at OFF, normal operation will be simulated. |
| Sensor level adjustment |   | Use it to adjust the level of sensors: last original sensor, original sensor, pre-registration sensor, reversal outlet sensor. |

### ■ Adjusting the Sensor Level

Perform the following to adjust the sensor level using the DIP switch:

1) Shift bit 4 of the DIP switch to ON, and press the push switch.
2) Close the reversal delivery cover, and place a black sheet of paper over the last original sensor. (Make sure that the paper does not cover the original sensor, i.e., the Original Set LED will not turn on.)
3) Open the pickup unit cover once, and then close it. (In about 3 sec, sensor adjustment will start.)
4) In several seconds, the original detection LED will flash twice, and then remain on. At this time, check the state of the sensor by referring to LED1 and LED2 on the DF controller PCB.
   The number of times LED1 flashes (at 300-msec intervals) indicates the sensor number. It flashes at intervals of 300 msec, remains off for 2 sec, and repeats the sequence. The following shows how each sensor may be identified:
   1: reversal outlet sensor
   2: pre-registration sensor
   3: original sensor
   4: last original sensor
   If LED2 remains on, the sensor in question is normal. If it remains off, the sensor in question is faulty.
5) To move to the next sensor, press the push switch. (With each press, you can move in the following sequence: 1 -> 2 -> 3 -> 4 -> 1 ->.
6) When all is done, shift bit 5 of the DIP switch to ON, and check to make sure that the Original Set LED has turned off.
7) Shift all bits of the DIP switch to OFF.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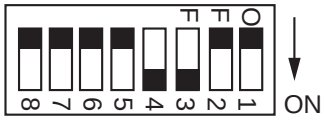
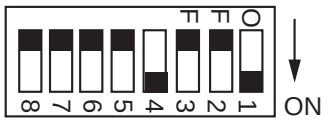
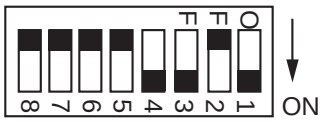
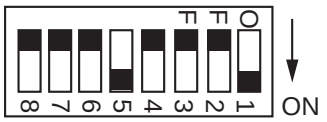
| Item | Setting | Description |
|---|---|---|
| Original tray width adjustment |  | Shift bits 3 and 4 of the DIP switch (DSW1) to ON. Adjust the original tray to A4 (for A/B configuration) or LTR (for inch configuration); then, press the push switch (SW1).<br>Adjust the original tray to A4R (for A/B configuration) or LTRR (for inch configuration); and, press the push switch once gain.<br>Lastly, press the push switch (SW1) once again, and shift all bits to OFF. |
| Registration position adjustment |  | Shift bits 1 and 4 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>Place one original on the original tray. (In about 3 sec, the original will be moved to the copyboard glass and stopped.)<br>Open the ADF, and check the position of the original. If it is to the left in relation to the image leading edge, shift bit 5 of the DIP switch (DSW1) to ON; if it is to the right, shift bit 6 to ON.<br>Press the push switch (SW1) as many times as necessary. A single press causes a shift of 0.34 mm.<br>The original will be discharged automatically when the ADF is closed. After adjustment, shift all bits to OFF. |
| Duplexing registration |  | Shift bits 1, 3, and 4 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>Perform the steps for "registration adjustment"; at the end, shift all bits to OFF. |
| Adjustment (pickup delivery) |  | Use this item if you want to use the ADF on its own for pickup and delivery.<br>Shift bits 1 and 5 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>Place an original on the original tray. In about 3 sec, the original will be moved to the copyboard glass and stopped.<br>The original will be discharged automatically when the ADF is opened and then closed.<br>When you have checked the operation, be sure to shift all bits to OFF. |

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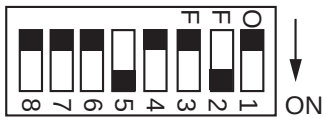
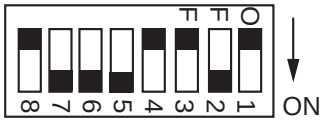
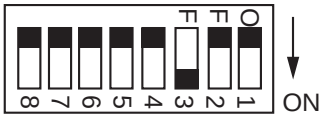
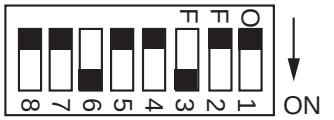
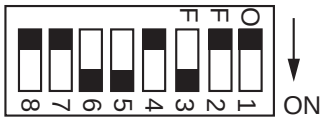
| Item | Setting | Description |
|---|---|---|
| Pickup delivery continuous operation |  | Use this item if you want to use the ADF on its own for pickup and delivery.<br>Shift bits 2 and 5 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>Place several originals on the original tray. In about 3 sec, they will be moved to the copyboard glass and then discharged.<br>When all originals run out, the operation will stop and the mode will be ended. When you have checked the operation, be sure to shift all bits to OFF. |
| Pickup delivery operation (without paper) |  | Use this item if you want to check the operation without using an original.<br>Shift bits 2, 5, 67, and 7 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF. In about 3 sec, pickup delivery operation will start.<br>After you have checked the operation, be sure to shift all bits to OFF. |
| Separation roller cleaning |  | Use this item to execute cleaning of the separation roller.<br>Shift bit 3 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>Place a sheet of copy paper on the original tray while holding onto its trailing edge so that the separation roller starts to rotate. Hold on to the paper so that the separation roller will rotate idly on the paper.<br>Remove the copy paper when the separation roller has stopped rotating. Open the ADF, and shift all bits of the DIP switch (DSW1) to OFF. |
| Pickup roller ascent (lifter descent) |  | Shift bits 3 and 6 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>The separation motor (M1) will rotate clockwise, and the pickup roller will move up (while the lifter will move down). In about 2 sec, the separation motor will stop automatically. When you have checked the operation, be sure to shift all bits to OFF. |
| Pickup roller descent (lifter ascent) |  | Shift bits 3, 5, and 6 of the DIP switch (DSW1) to ON, and press the push switch (SW1); then, close the ADF.<br>The separation motor (M1) will rotate counterclockwise, and the pickup roller will move down (while the lifter moves up). In about 2 sec, the separation motor will stop automatically. After you have checked the operation, be sure to shift all bits to OFF. |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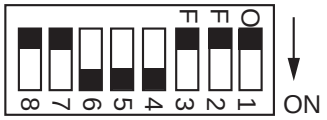
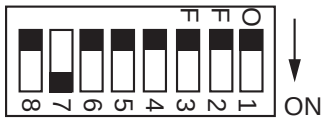
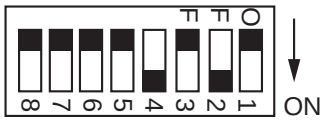
| Item | Setting | Description |
|---|---|---|
| EEPROM initialization |  | Shift bits 4, 5, and 6 of the DIP switch (DSW1) to ON, and keep the pickup unit cover open.<br>While holding down the push switch (SW1), turn off and then on the copier.<br>LED2 will turn on when the EEPROM on the ADF controller PCB has been initialized.<br>When it has turned on, shift all bits to OFF, and turn off the power. |
| Last original sensor off |  | Use this item as a remedy in the event that the last original sensor (U504) fails. Shift bits 7 of the DIP switch to ON so as to disable the last original sensor. After you have checked the operation, be sure to shift all bits to OFF. |
| Last original sensor operation check mode |  | As a rule, the last original sensor turns on in response to a press on the Copy Start key. Use this mode to find out if the activation (emission of light) occurs normally.<br>Shift bits 2 and 4 to ON, and press the push switch so that light is emitted while the setting remains the same. Check the emission of light using a meter during this period.<br>Press the push switch once again to end the mode. Be sure to shift all bits to OFF after the work. |

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# VI. SELF DIAGNOSIS

## A. ADF Self Diagnosis

The microprocessor on the ADF controller PCB is equipped with a mechanism that checks the condition of the ADF. It runs checks as needed and, when it finds a fault, it will indicate an error code on the copier's control panel.

| Code | Cause | Description |
|---|---|---|
| E400 | · The communication with the copier is faulty. | · The communication with the copier is monitored at all times. This error is identified if it is interrupted for 5 sec or more. |
| E402 | · The feed motor (M2) fails to rotate.<br>· The feed motor clock sensor (SR1) is faulty. | · The feed motor encoder pulse is not detected within 300 msec after the feed motor drive signal has been turned on. |
| E404 | · The reversal delivery motor (M3) fails to rotate.<br>· The reversal delivery motor clock sensor (SR7) is faulty. | · The reversal delivery motor encoder pulse is not detected within 300 msec after the feed motor drive signal has been turned on. |

**Table 5-501**

**Caution:**

1. If the self diagnostic mechanism has turned on, you may reset the machine by turning off and then on the copier.
2. You may continue to make copies while the ADF is out of order. Open the ADF, and place originals on the copyboard glass.


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# APPENDIX


A. GENERAL TIMING CHART ..... A-1
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C. GENERAL CIRCUIT DIAGRAM ..... A-7
D. ADF CONTROLLER PCB ..... A-8
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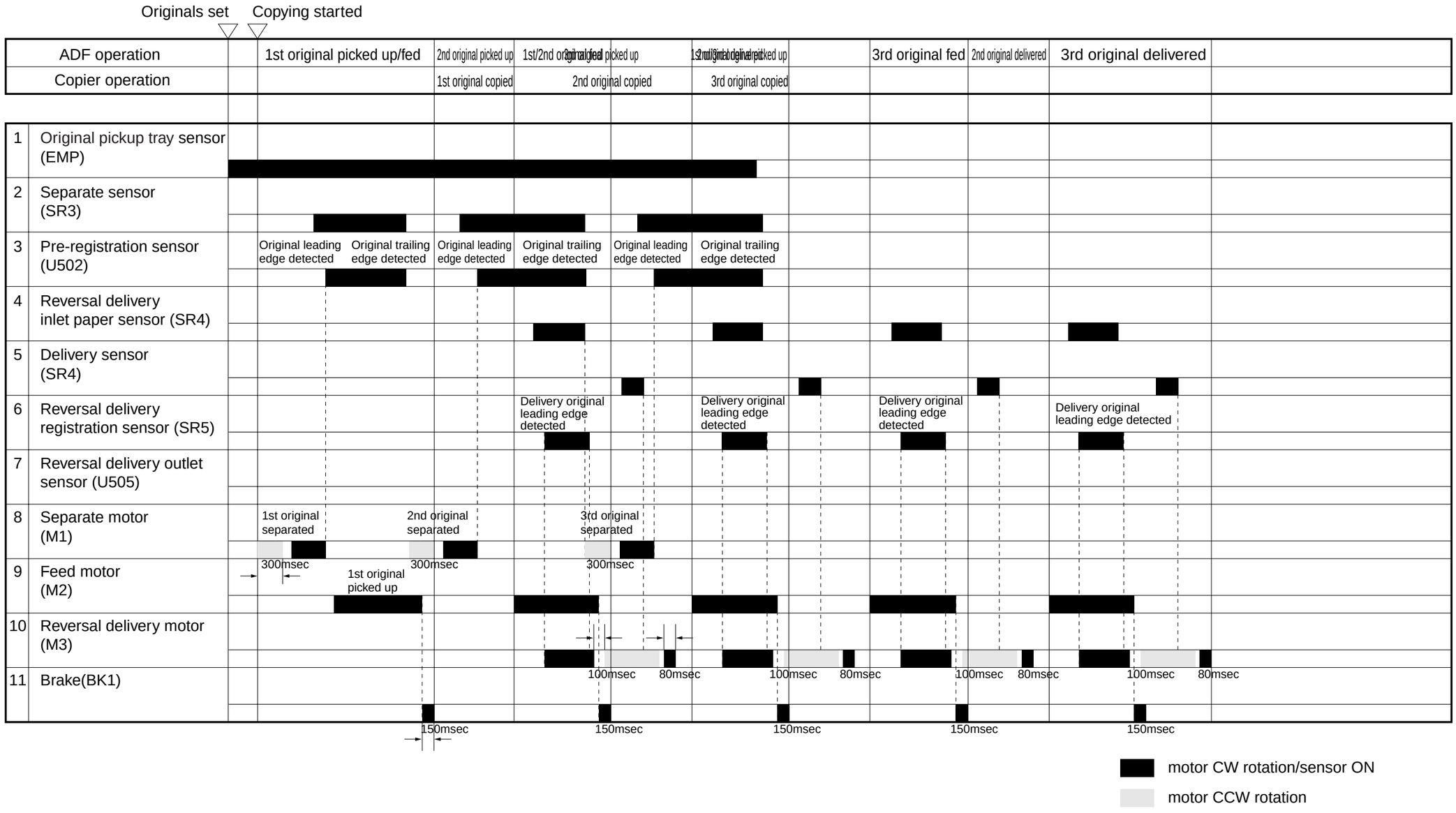
## 1. Small-Size, 3 Single-Sided Originals, Continuous Copying

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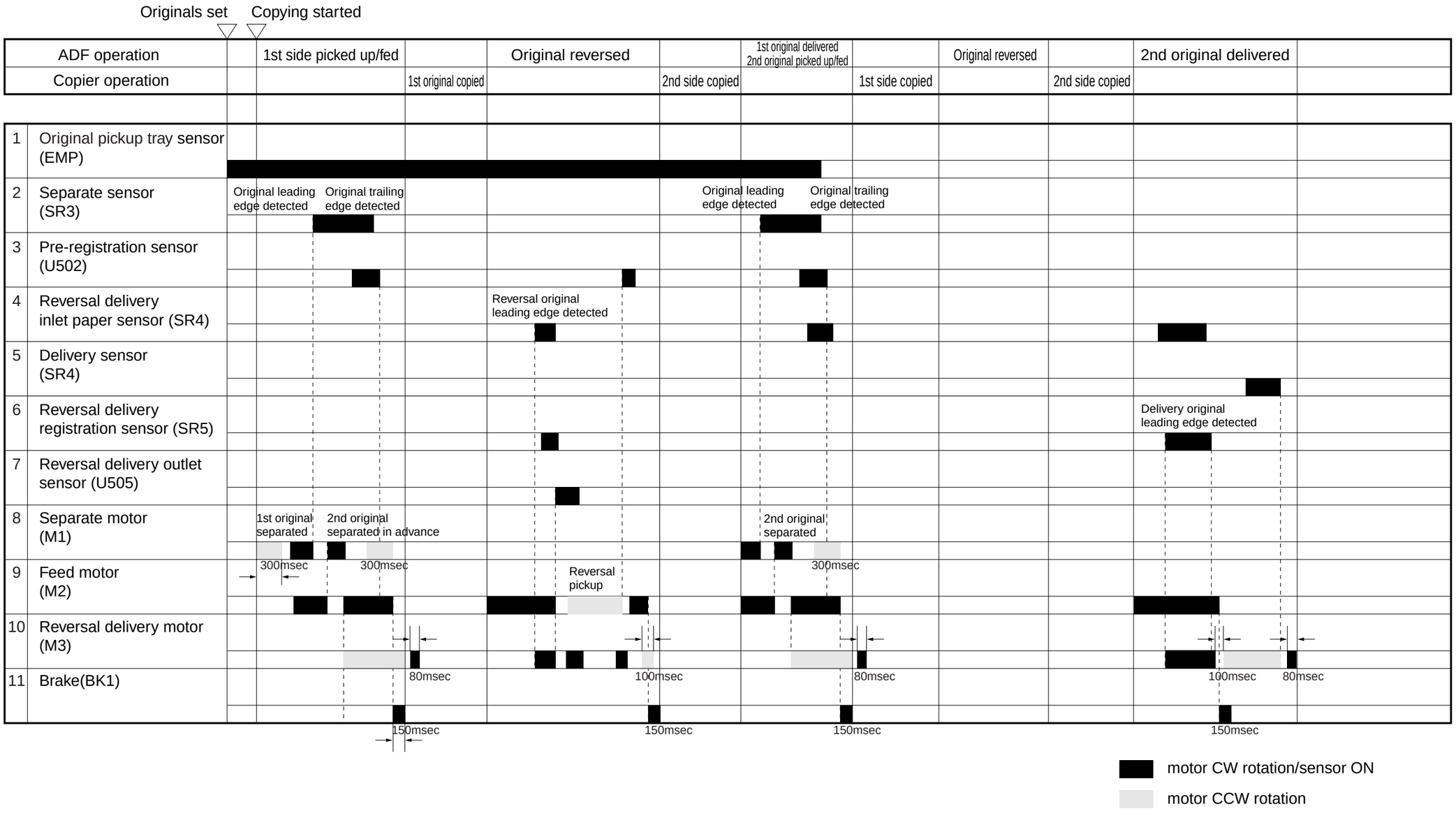
## 2. Small-Size, 2 Double-Sided Originals



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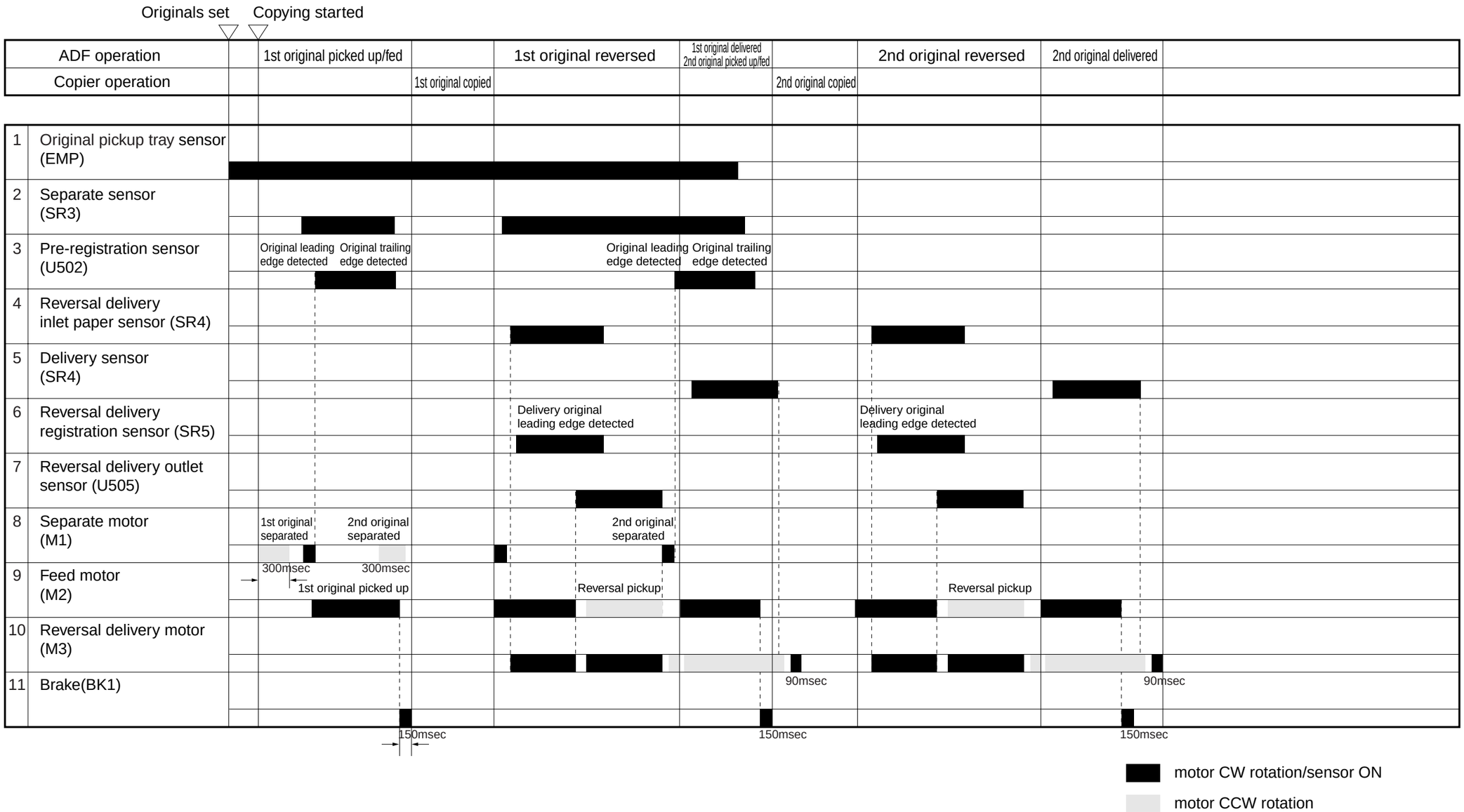
## 3. Large-Size, 2 Single-Sided Originals

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# B. SIGNALS AND ABBREVIATIONS

| | |
|---|---|
| Separation Motor Drive signal | SPM |
| Separation Motor Rotation Speed Control signal | SMPWM |
| Separation Motor Rotation Direction signal (CW) | SMFWD |
| Separation Motor Rotation Direction signal (CW) | SMREV |
| Feed Motor Drive signal | FDM |
| Feed Motor Rotation Speed Control signal | FMPWM |
| Feed Motor Rotation Direction signal (CW) | FMFWD |
| Feed Motor Rotation Direction signal (CCW) | FMREV |
| Feed Motor Clock signal | FMCK |
| Feed Motor Brake Drive signal | BK* |
| Reversal Delivery Motor Drive signal | EJM |
| Reversal Delivery Motor Rotation Speed Control signal | EMPWM |
| Reversal Delivery Motor Rotation Direction signal (CW) | EMFWD |
| Reversal Delivery Motor Rotation Direction signal (CCW) | EMREV |
| Reversal Delivery Motor Clock signal | EMCK |
| Pickup Unit Cover Open/Closed Detection signal | SCVR |
| Pickup Detection signal | SPR |
| Original Set Indicator ON signal | OGLED |
| Original Pickup Tray Detection signal | EMP |
| Last Original Detection signal | LAST |
| Original Size Detection signal | WIDE |
| Pickup Registration signal | ENT |
| ADF Open/Closed Detection signal | OPEN |
| Reversal Delivery Outlet Paper Detection signal | TURN |
| Reversal Delivery Unit Cover Open/Closed Detection signal | ECVR |
| Reversal Delivery Registration signal/Delivery Detection signal | EREG |
| Reversal Delivery Inlet Paper Detection signal | EENT |

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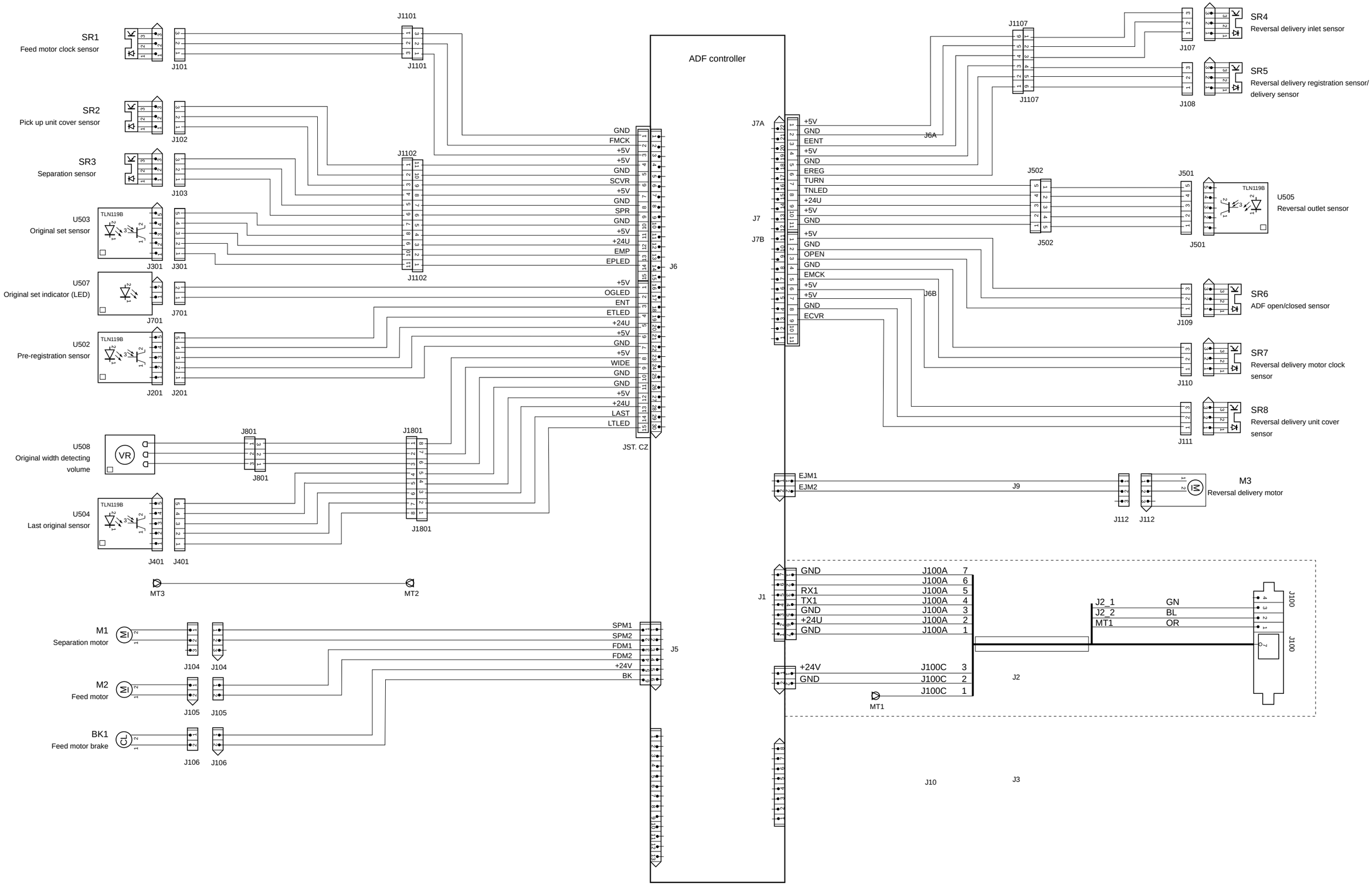
# C. GENERAL CIRCUIT DIAGRAM

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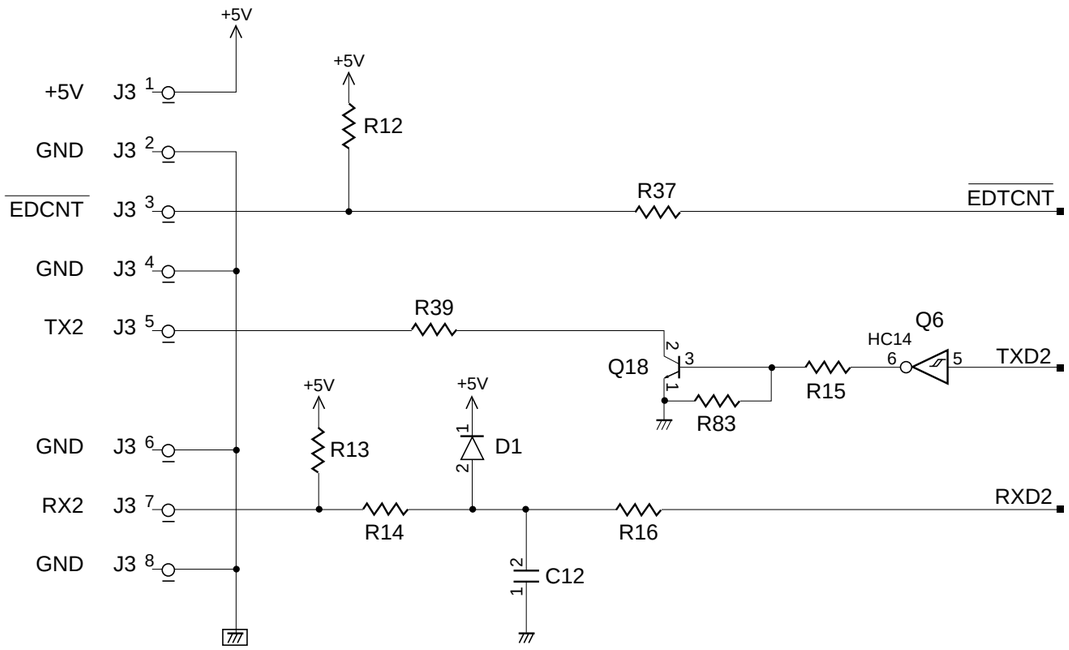
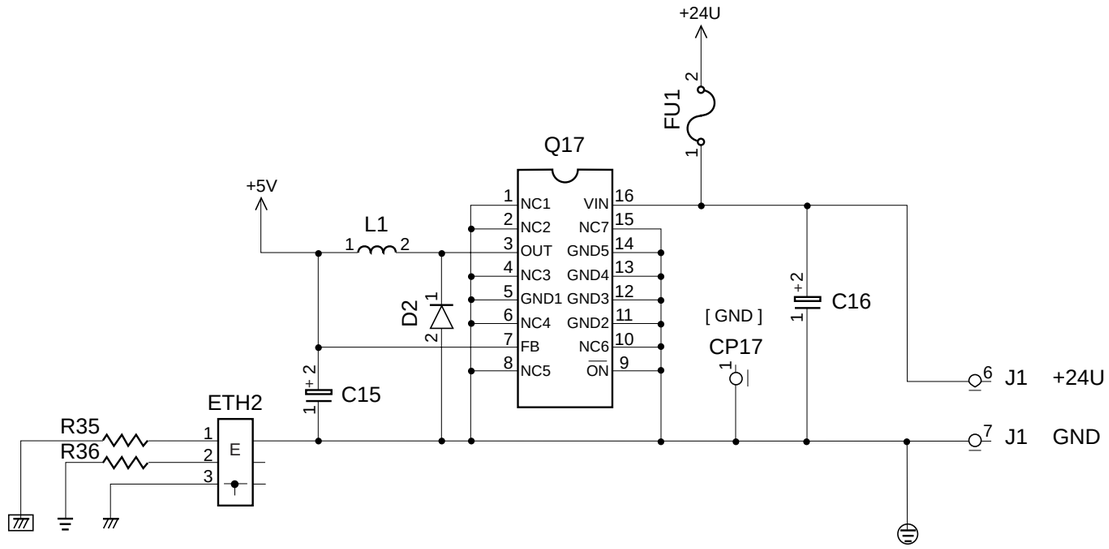
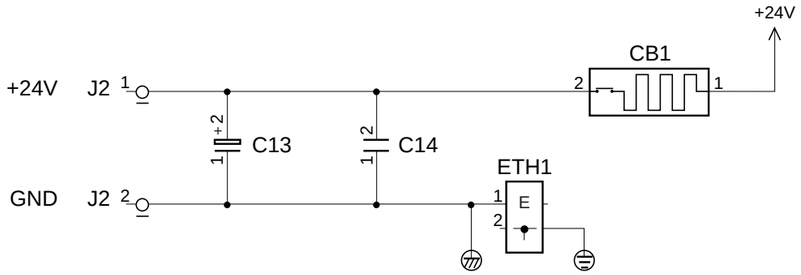
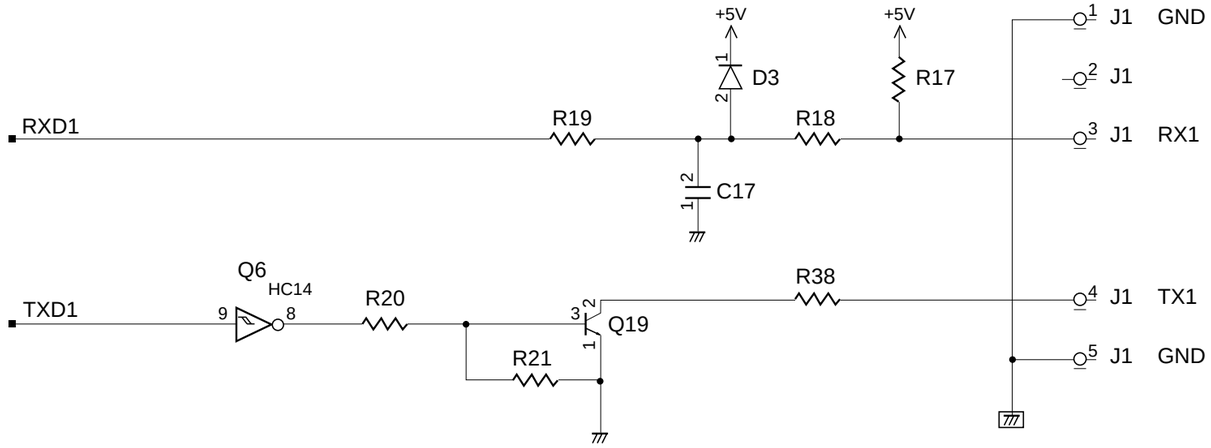
# D. ADF CONTROLLER PCB

· ADF Controller PCB (1/4)



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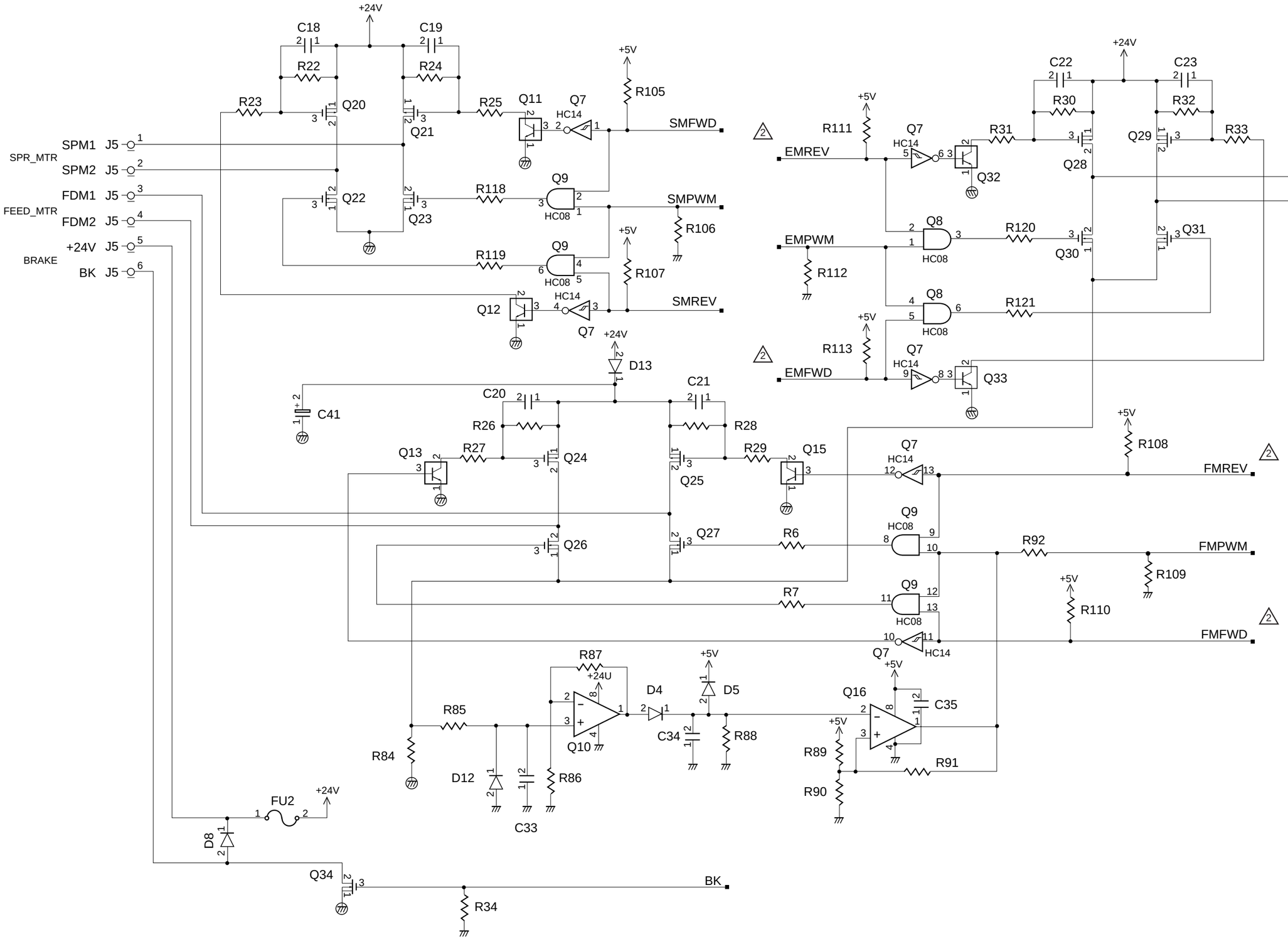


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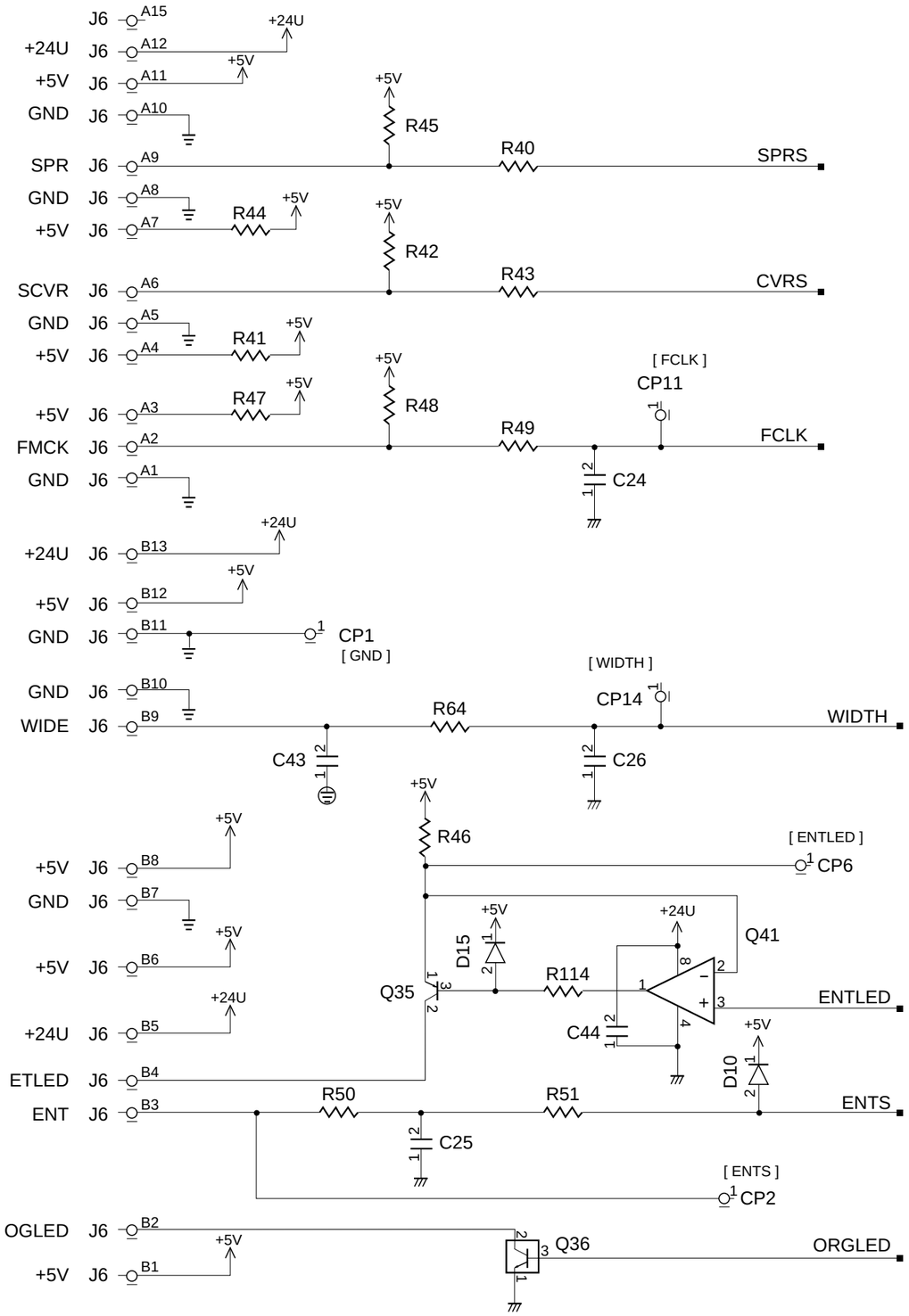
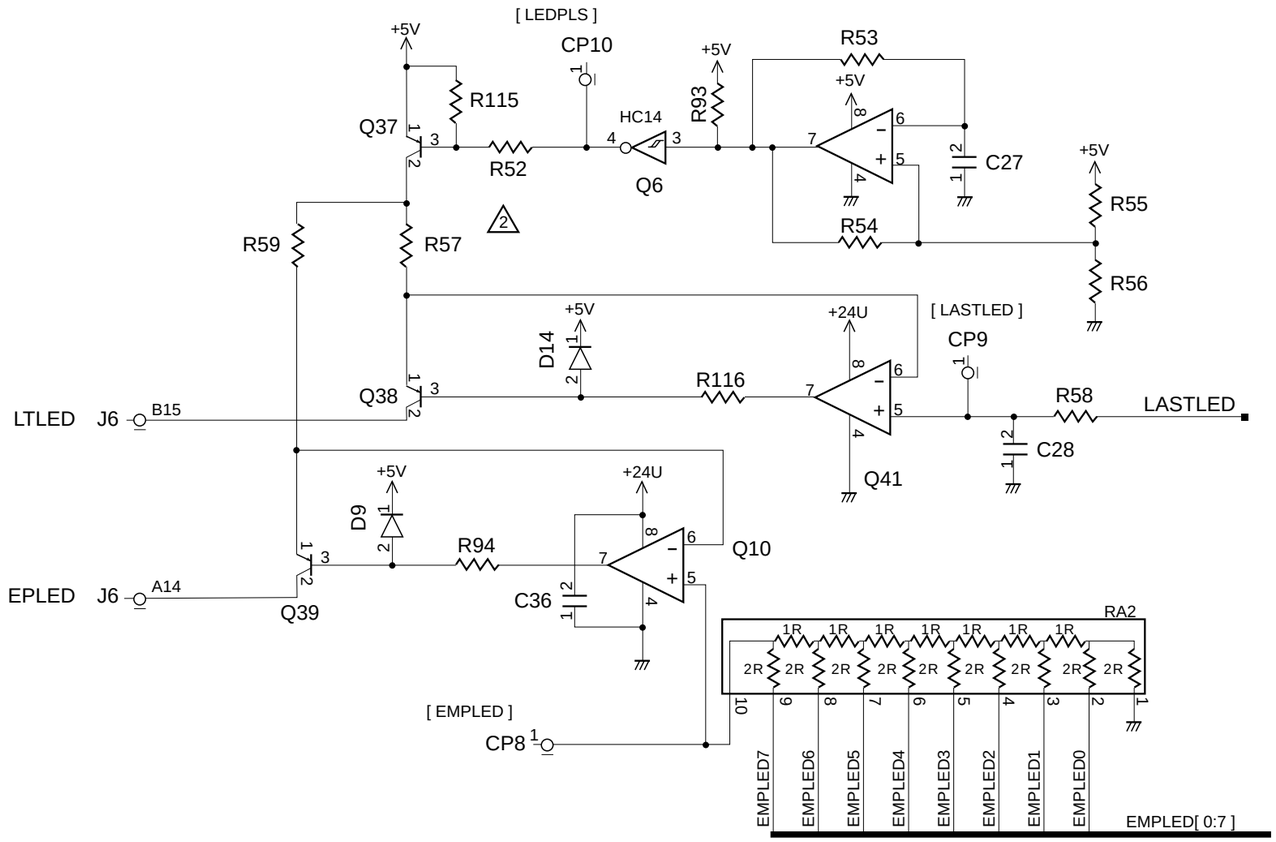
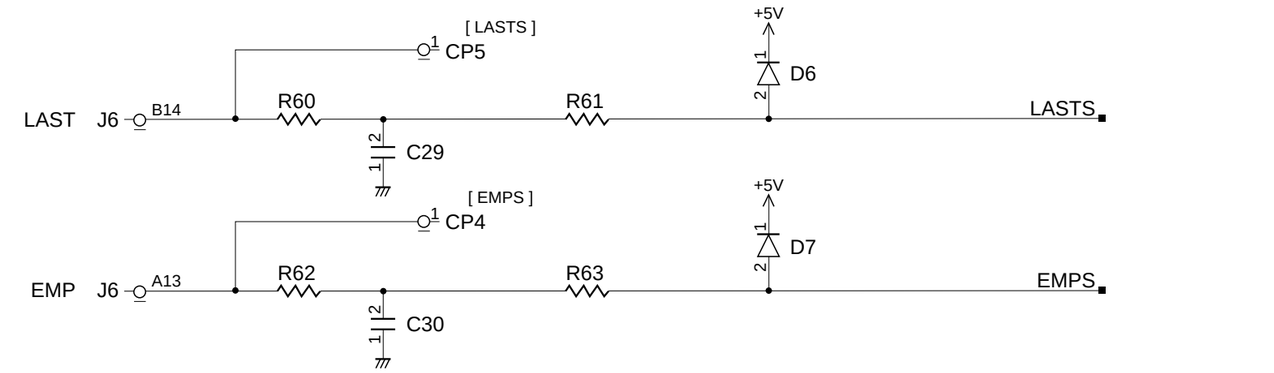
· ADF Controller PCB (3/4)



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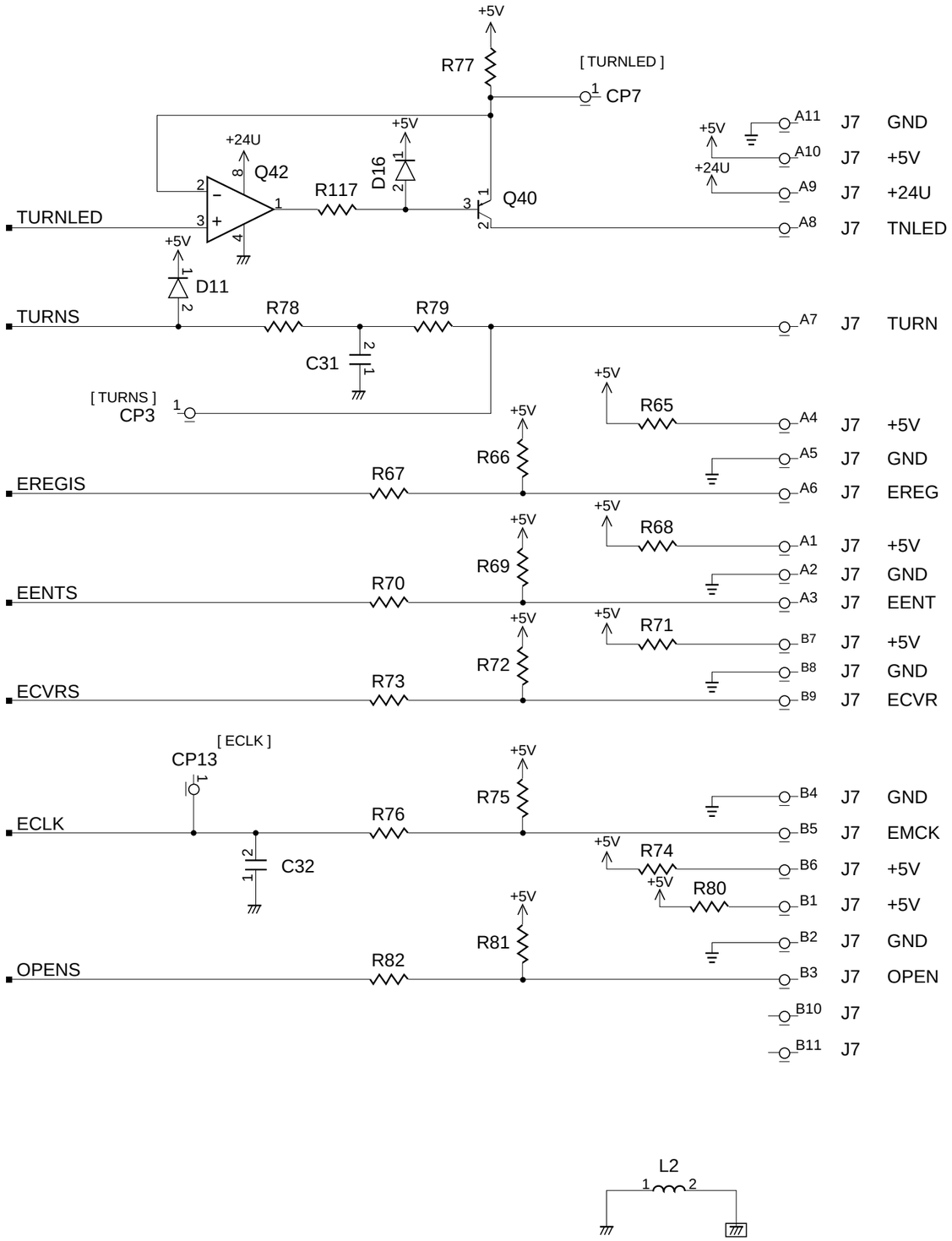


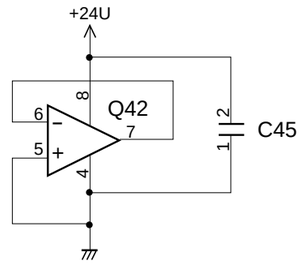


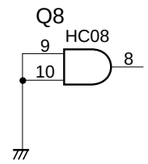


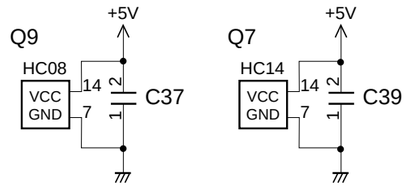


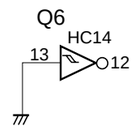


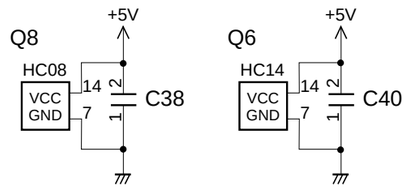





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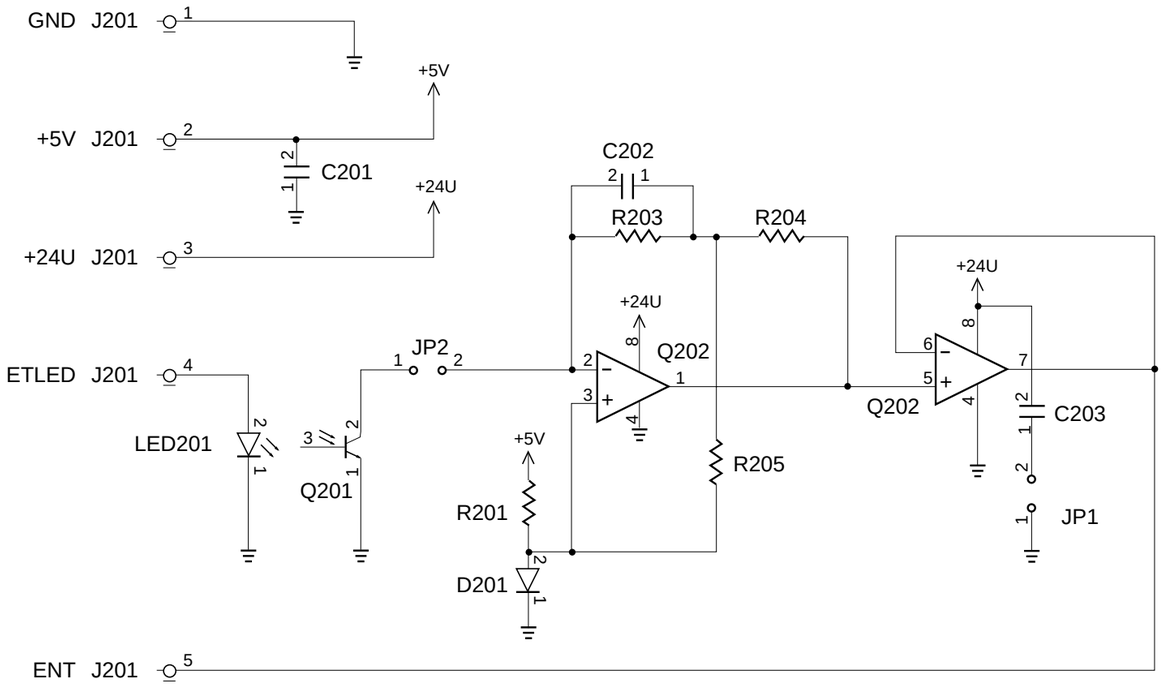
# E. PRE-REGISTRATION SENSOR PCB



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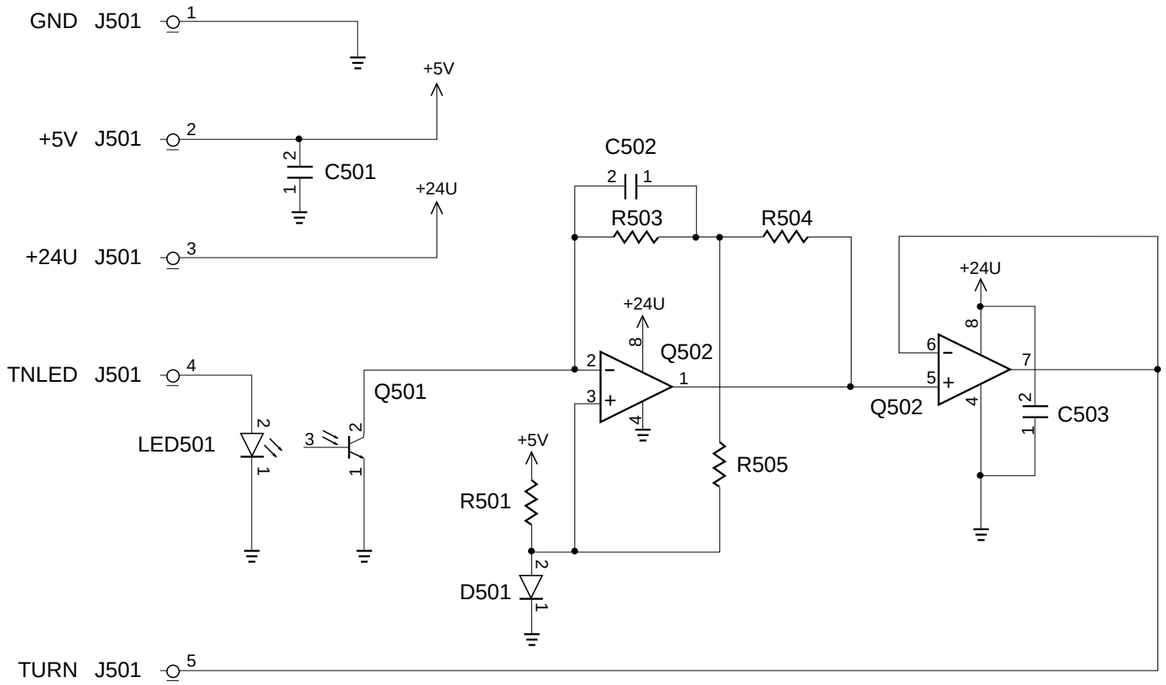
# F. REVERSAL OUTLET SENSOR PCB

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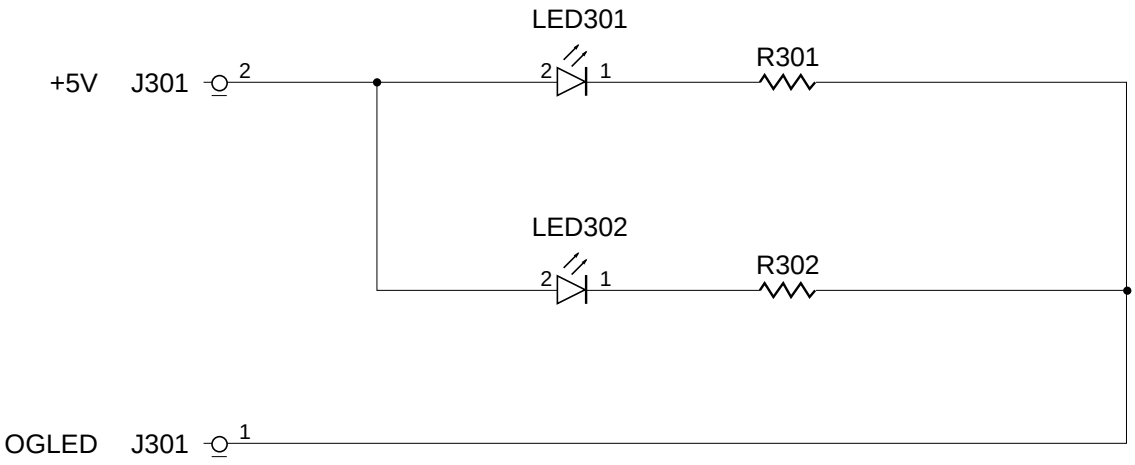
# G. ORIGINAL SET INDICATOR LED PCB

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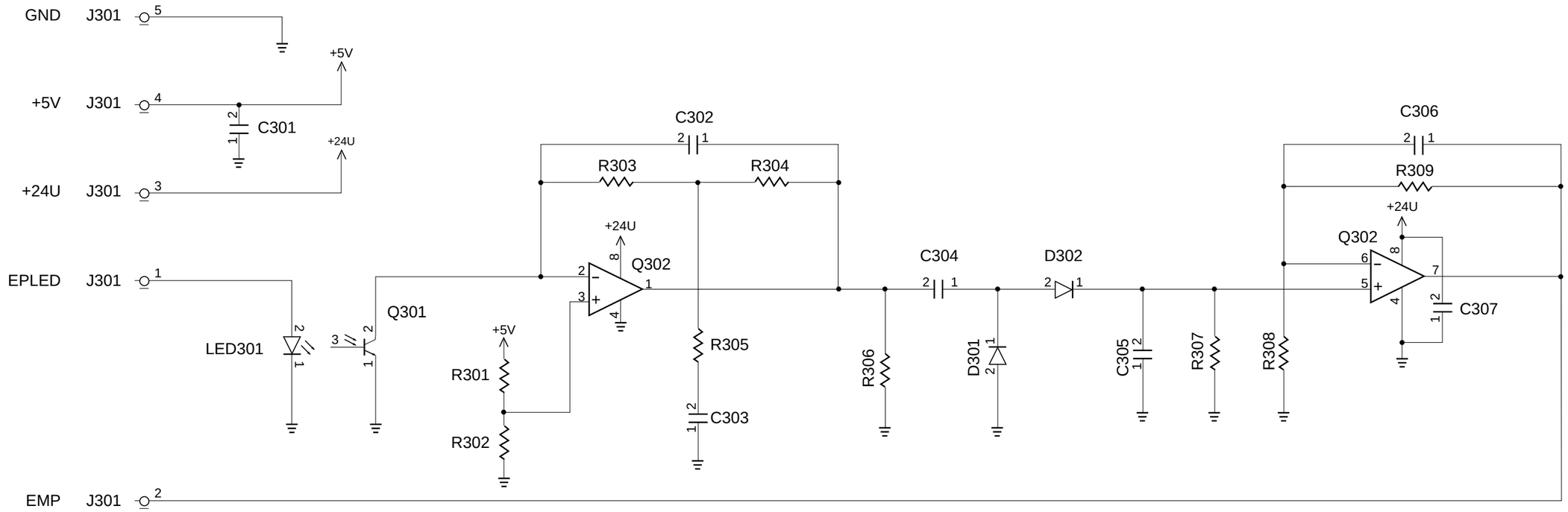


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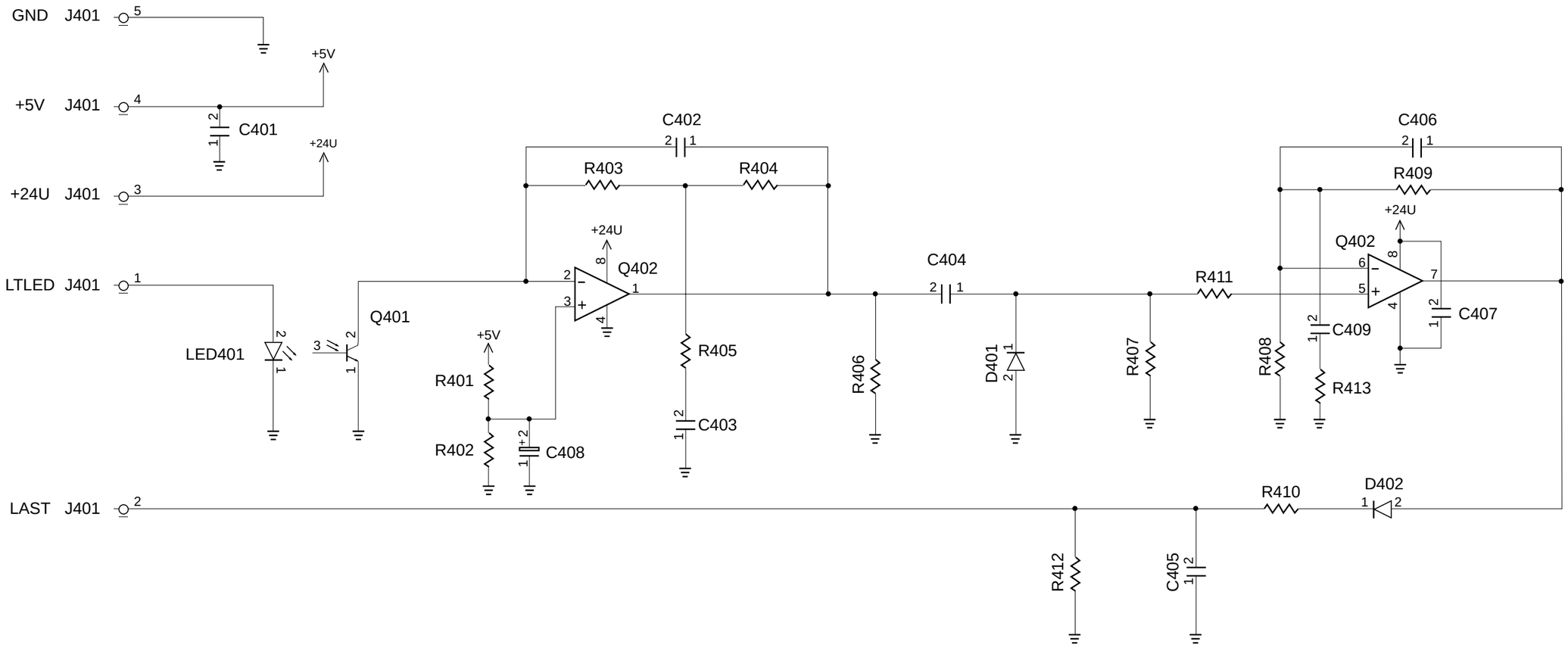
# I. LAST ORIGINAL SENSOR



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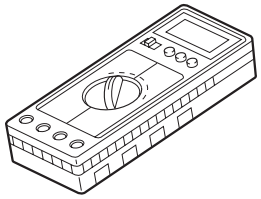
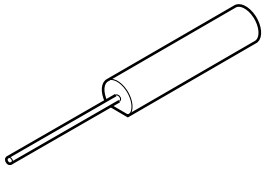
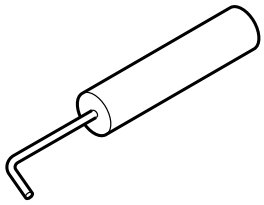
# J. SPECIAL TOOLS

You will need the following special tools in addition to the standard set of tools when servicing the machine.

| No. | Tool name | Tool No. | Shape | Rank | Shape |
|---|---|---|---|---|---|
| 1 | Digital multimeter | FY9-2002-000 |  | A | For making electrical checks:<br>· Use it in combination with the laser power checker when adjusting the intensity of the laser. |
| 2 | Probe extension pin | FY9-3038-000 |  | A | For adapting the meter probe when making electrical checks. |
| 3 | Probe extension pin (L-shaped) | FY9-3039-000 |  | A | For adapting the meter probe when making electrical checks. |

**Reference:**

The ranking notations indicate the following:
A: Each service person is expected to carry one.
B: Each group of five service persons is expected to carry one.
C: Each workshop is expected to carry one.

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# K. SOLVENTS AND OILS

| No. | Name | Uses | Composition | Remarks |
|---|---|---|---|---|
| 1 | Ethyl alcohol (Ethanol)<br><br>Isopropyl alcohol (Isopropa-nol) | Cleaning: e.g., glass, plastic, rubber parts; external covers | $C_2H_5O$<br><br>$(CHZ_3)_2$ CHOH | · Do not bring near fire.<br>· Procure locally.<br>· Isopropyl alcohol may be substituted. |
| 2 | Lubricant | Lubricating: e.g., drive and friction parts. | Silicone oil | Toll No.: CK-0551 (20 g) |


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